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here is only one voice which is soft enough to speak on a northern stream.
and that is the voice of a lone canoe, which never disturbs its dream.
The word of a blade is soft as a sigh, and blends with the balsam's croon
and the hemlock's cry and the rune of reeds and the laughter of the loon.

Wilson MacDonald

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OTTAWA, CANADA

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As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography—historical, physical and economic—first of Canada, then of the British Empire and of the other parts of the world in which Canada has special interest. It is the intention to publish articles in this magazine that will be popular in character, easily read, well illustrated and educational to the young, as well as informative to the adult.

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The Society has no political or other sectional associations, and is responsible only to its members. All money received is used in producing the Canadian Geographical Journal and in carrying on such other activities for the advancement of geographical knowledge as funds of the Society may permit.

MECHANIC: Who are you? I never remember seeing YOU around here before.

STRANGER: Oh! I'm the Ghost—the fellow who brings your pay envelope. Here, take it!

MECHANIC: YOU bring me my pay envelope? How did you get into this?

STRANGER: I've been around here quite a while, but some folks don't look very hard. Remember those screws you turned out . . . the funny kind with the left-hand thread?

MECHANIC: Sure, I remember. They did seem wacky —who wants a left-hand thread? Say, you must be from that Bombay engineering company . . .

STRANGER: That's right. We bought your screws. And the money we paid for them is in your envelope now. My friends buy many more things you make.

MECHANIC: Your friends? How many more friends have you around this plant, Mr. Ghost?

STRANGER: Far more than you think. There's a gentleman from China who uses your parts in his rice mills . . . two from the Netherlands East Indies . . . another from Peru, and . . .

MECHANIC: Mm-mm. So that's where my wages come from. Look, Mr. Ghost, you and your buddies will stick around here, won't you? Perhaps there is something I can do to make it worth your while . . .?

STRANGER: There *is* something you can do. You can put your best work into each part you make. That will please us, and we will keep on buying more from you.

MECHANIC: Is there anything else I can do?

STRANGER: Yes, there is . . . but I don't like to mention it, because you people in Canada have gone without many things you like for a long time. But if you can share with us the things you make . . . right now . . . we will keep on buying in the future. That means your job will last.

MECHANIC: You mean . . . we can count on the Ghost walking every Friday? Plenty of employment?

STRANGER: That's right. Lots of work. See you next Friday, my friend.

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CANADIAN GEOGRAPHICAL JOURNAL

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The articles in this Journal are indexed in the *Reader's Guide to Periodical Literature* and the *Canadian Periodical Index* which may be found in any public library.

The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the Oxford Dictionary as edited in 1936.

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The Growth of London, Ontario

by EDWARD TAUBE

The Site and Situation Factors

A Lieutenant-Governor was responsible for the first town planning for London, Ontario. John Graves Simcoe thought seriously about the site while looking along the course of the Thames River for a central spot upon which to build the proposed new capital of Upper Canada. Approaching from the west on March 2nd, 1793, the Lieutenant-Governor and his men halted where the two forks of the river meet. On the other side, beginning with a bank forty feet above the water, there stretched towards the northeast a gently rolling terrain covered with thick stands of mixed hardwoods and softwoods. The trough of the Thames dominated this vista of forest and swamp. Only the year before Simcoe had given the river its present name, to replace the Indian *Askenessippi* (antler-river) and the French *La Tranchée* (the trench).

Trees have been thinned out, hills cut down, and swamps drained, but the general contours are now as they were then (Fig. 1). Here and there the marks of past floods are still visible, small islands have arisen or have passed away, while meanders have straightened out either through the aid of man or the efforts of the river itself. Storm sewers restrain the tiny streams that in past years shared in the work or play of the infant community. Two blocks south of the Court-house ran a brook which furnished water for the tanneries. Less than a mile to the north, Carling's Creek, after being

At top:—Photo 1—Wheat harvest near London
Photo by L. C. Harvey

deepened, widened and dammed to form Lake Horn, took care of the recreational needs of a nearby garrison, besides turning the wheel of Waters' Mill. The lowest land lies along the course of the river, the highest in the northeast, with a difference in elevation of about 130 feet between the Cove area and the northeastern end of the city.

Simcoe well understood the regional and political implications of his choice. Visualizing the Thames as the principal highway of travel and transport, he saw London as the head of navigation and the assembly point for the furs of the tributary area. What struck him most of all, however, was its central position within the heart of a fertile country.

Soil and climate have proved suitable for general farming (Photo 1). The pioneer farmers could market their surpluses and satisfy their needs in London Village, from which, in harmony with the development of the back country, London City emerged in only a little more than a quarter of a century. London continues to serve as a market for agricultural produce and a supply depot for the farmers of the region. As soon as modern means of transportation linked it with its larger hinterland, it began to respond all the more readily to the growth of its tributary area.

The climate of the London district differs very slightly from that of southwestern Ontario as a whole. Its mean annual temperature hovers around 45° F., with its mean winter temperature 25° and the mean summer temperature 65°. Because the city lies inland, it does not feel the maximum influence of the Great Lakes. The growing season begins one week later than at the southernmost point in Ontario and ends one week sooner; that leaves almost 200 days, of which 135 are frost-free. The average annual precipitation of 38 inches (20 per cent in the form of snow) is distributed fairly evenly over all the months.

The topography of the region reflects the work of the Wisconsin glacier, which left as its most striking feature a great horseshoe-shaped system of moraines (Fig. 2). After sweeping around the highest point in southwestern Ontario, 1,779 feet above sea level, it sends down two limbs that slope towards the southwest and embrace a gently rolling till plain. The covering on the bedrock increases along this downward slope, from a shallow depth at the 1,779-foot level to

Fig. 1:—The site of London, Ontario. Of the three parts into which the Thames River divides the city, the northeastern one is by far the largest. The river and its tributary creeks enter into the lives of present-day Londoners in connection with drainage, flood damage, dumping, and sewage disposal, but unfortunately not as a fully developed phase of London's beauty.

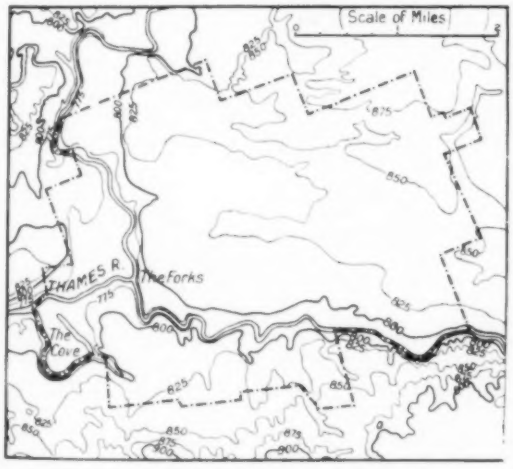


Fig. 2:—London's location on the till plain with respect to the horseshoe moraine. The map shows only the moraines that resulted from glacial action (till moraines). Those deposited by meltwater (kame moraines) provide some rough topography along the inner rim northwest and southeast of the till plain, while glacial spillways account for further irregularities in the landscape.

Photo 2—London a an infant settlemen east of the forks. Th Court-house the faced the river.

From a painting b James Hamilto

Below:—Photo 3— Looking west alon Dundas Street abou 1840.

From an old engravi

260 feet of overburden south of Chatham.

London lies on the till plain, about one hundred miles southwest of the maximum elevation, at a level of 752.5 to 884.88 feet. Two tongues of ice, as they retreated and readvanced, left a series of moraines to the north and the south of the city, of which the nearest are the Milverton and the Ingersoll moraines. The material is boulder-clay, with a marked admixture of limestone from the bedrock (the Norfolk formation). The shorelines of various glacial lakes may be traced south and west of London. Into one of these the Thames, flowing in a glacial spillway, debouched the Caradoc sands, which cover thousands of acres west of the city and grow good crops of tobacco.

The grey-brown forest soils of the immediate hinterland comprise clay loams, silt loams, and sandy or gravelly loams. Clay deposits supply material for bricks, tiles, and drain pipes, while outcroppings of limestone furnish some building stone. Road metal is obtained from extensive beds of sand and gravel. Gas and oil are almost entirely exhausted.

Wells, both private and public, originally yielded enough water for the young community of London. The well for the jail is the first one recorded. However, when the demand became increasingly urgent with the rise in population, a vigorous search for more adequate sources of supply was instituted. Several ponds in Westminster Township proved unfit because of surface water; various artesian wells bore strong traces of sulphur. A large supply was at last discovered at Springbank, together with a convenient hill for the reservoir. Subsidiary sources were called upon as the need arose.

The Pattern

Simcoe's plan for a capital on the Thames never materialized, and a whole generation passed away before the first buildings sprang up on the tract of forest land reserved for that purpose. In 1826 Mahlon Burwell surveyed 240 acres for a town plot, making his blocks rectangular in shape and dividing each one into ten half-acre lots. Present-day Queen's Avenue, Wellington Street, and the river mark the general limits of this survey.

At that time the authorities at York (Toronto) decided that a central location within the London district would be the most suitable spot for a court-house. Work began almost at once in the northwest corner of the town plot, directly east of the forks. The first jailer and innkeeper already had a shanty south of the court-house site, and before long an infant settlement came into being (Photo 2). Fashioned of native brick, but patterned after the ancestral Irish castle of Thomas Talbot, the Court-house constituted the pride of the pioneers.

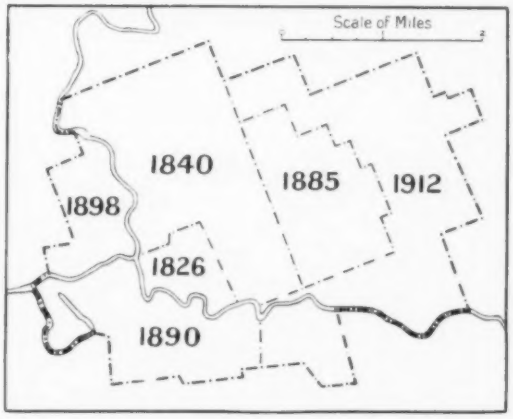


Fig. 3:—The town surveyed by Mahlon Burwell in 1826 contained about 240 acres. Along the river bank that bounded the town plot to the south and the west he left the land undivided as a meadow. From time to time additional areas were annexed, some already built up and others still undeveloped. London now covers 6,873 acres, of which the streets occupy 1,312 and the river 166.

Near it they built their homes, stores, tanneries, and foundries.

Settlers tended to avoid the swampy southwest river section. However, so rapidly did they cross the northern and eastern boundaries that by 1840 a new survey had pushed out the limits to Huron Street in the north and Adelaide Street in the east, thus creating a settlement area of almost three square miles. The space enclosed could accommodate a large population; hence the limits remained fixed until 1885, when London East became a part of the city. London South followed in 1890, London West in 1898, Knollwood, Pottersburg, Ealing, and Chelsea Green in 1912 (Fig. 3). The maximum distance across London from east to west is $4\frac{2}{3}$ miles, from north to south $3\frac{3}{5}$ miles.

Growth continued to reach out towards the east and the north (Photos 3, 4, 5), up the

Photo 4—A view of London, Canada West, published by E. Whitefield in 1855.
Courtesy *London Free Press*

Photo 6—An air photo of the forks. Observe that growth has tended towards the east.
Courtesy Ontario Department of Lands and Forests

Right:—Photo 7—London's skyline as seen from the south, with the Dominion Public Building, the Huron and Erie Mortgage Corporation, and the Hotel London standing out prominently.

Photo by S. G. Hueston

Photo 5—London's skyline as seen from the north in 1897. Homes such as those in the foreground are typical of this area.

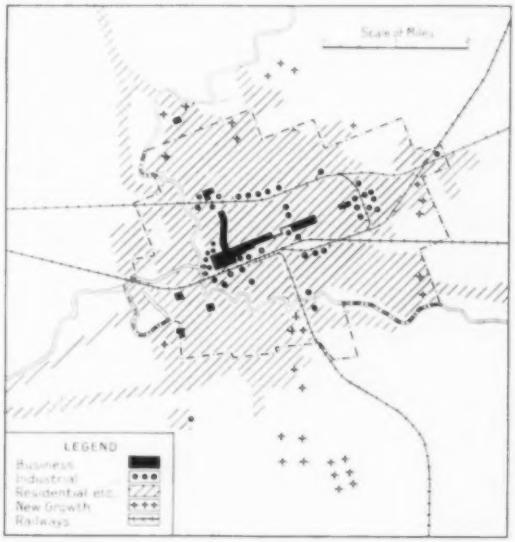
gently rolling incline, while tardy segments crossed the river to the south and very hesitatingly entered the lowlands west of the north branch. Flood hazards, poor drainage, and the river barrier prevented the formation of concentric rings about the central business district (Photo 6). Sprawling symptoms showed up here and there as expansion sought to bypass several undesirable areas, notably a creek in West London, the properties along the Cove, and various lowlands beside the Thames.

With increase in size came a differentiation of function, though there is considerable overlapping in the different types of land-use (Fig. 4). Commercial firms hug the nucleus or the major streets, industries cling to the railroad tracks, and mansions gravitate towards the north. The central business district shows strongest evidence of vertical growth (Photo 7), but the industrial structures along the interswitch in London East also give their characteristic touch to the skyline. Institutions requiring extensive tracts of land were placed along the outer fringe of growth: the University of Western Ontario in the northwest, Ontario Hospital in the east, and Westminster Hospital to the southeast. Schools and churches obviously have to be within the residential sections they serve.

City fathers of the past and the present have devoted considerable attention to parks and playgrounds, so that the total area now seems adequate, even if the matter of strategic location requires adjustment. The oldest is Victoria Park, acquired in 1869 and situated near the centre of the city (Photo 8); the largest is Springbank Park, four miles down the river and 325 acres in size (Photos 9, 10). Some citizens feel certain that the river banks can be improved if dams are built and stream pollution is discouraged.

The original survey of 1826 set up the

Fig. 4—The central business district grew up east of the forks and sent out offshoots towards the Canadian Pacific Railway Station in the north and towards London East, where the main industrial quarter is located. The north end and sections of South London have attracted the more expensive type of residence, while the eastern and south-eastern parts offer suitable sites for the homes of factory workers. At various points beyond the city limits lie the well kept mansions of the wealthy, strings and clusters of moderate-sized dwellings, and housing units sponsored by the Government.



Above:—Photo 9—The Thames River near Springbank Park

Photo by L. C. Harvey

Top right:—Photo 10—Echo Bridge over a tributary of the Thames River, a short distance from Springbank Park

Photo by L. C. Harvey

Left:—Photo 8—The fountain in Victoria Park

Courtesy London Chamber of Commerce

gridiron pattern for London's streets (Fig. 5). With the growth of the city, adjacent farms were divided and subdivided according to the rectangular layout. Accretion rather than planned growth resulted in a conglomeration of blocks—long, short, narrow, wide, angular.

British royalty furnished the names for King, York, and Clarence Streets and government officials those of Dundas, Richmond, and Bathurst. Oxford, Piccadilly, Regent and Wellington Streets, County of Middlesex, Blackfriars Bridge, Victoria Park, and Covent Garden Market are further examples of the prevailing English influence. Three-quarters of a century ago city councillors decided that Richmond Street should include Mark Lane, Sarnia, and Burlington

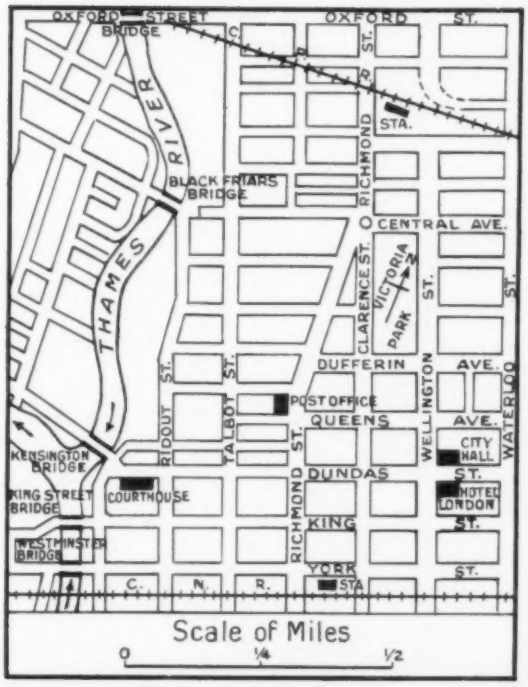
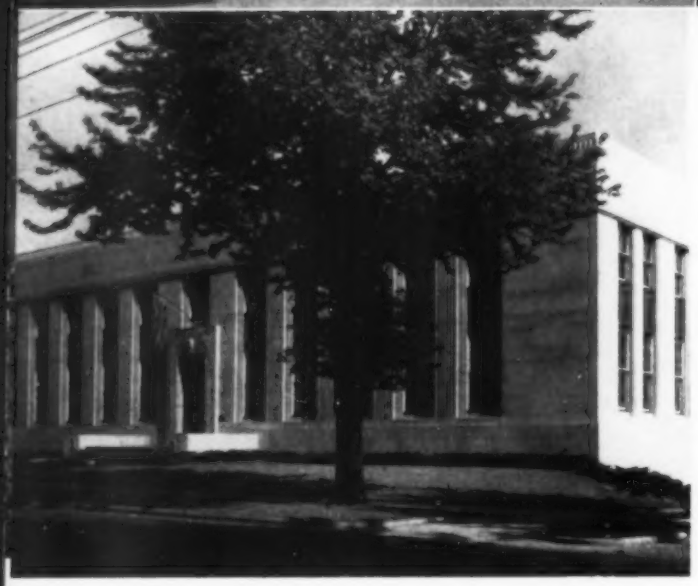


Fig. 5:—With no over-all plan to guide them, owners divided their properties according to their own fancies. This resulted in irregularly shaped blocks and lots. Note the effect which the river has had upon the pattern.



Top left:—Photo 15—The Dominion Public Building, with the old post-office nearby
Courtesy London Chamber of Commerce

Above:—Photo 16—Looking to the northeast over St. Peter's and St. Paul's Cathedrals.
Photo by S. G. Hueston

Left:—Photo 17—London Public Library
Courtesy London Chamber of Commerce

Streets. Further attention might well be given to thus reducing the number of street names!

Bogs on Ridout and Richmond Streets hindered transportation within the settlement. At first there were no ditches to carry off the surplus water and only the occasional log or plank suggested a sidewalk; consequently, man and beast often sank down deep into the mud. Belated citizens depended upon either lanterns or the dim light of candles shining through the small window-panes to avoid the mud-puddles or the charred stumps that obstructed the roadways.

London Village (1840) began to show a little more concern for its streets, and extended the system, laying down planking or gravel, cutting away the hills, and digging out water-courses. Additional progress was made by London Town (1848), particularly in introducing gas lighting. Throughout the years London City (1854) has kept abreast of the times with regard to street lights, traffic controls, pavements, sidewalks. Trees planted on almost every street once again give meaning to the name "Forest City", to which London had a just claim while a tiny clearing in a vast forest.

Housing

The pioneer log houses lay scattered over the clearing, each with its garden, each a set distance from the road. The first two-storey frame structure, near the corner of Dundas and Ridout Streets, created quite a stir. However, brick buildings, though still of very plain exterior, soon loomed above the wooden shanties. Because of its abundance, wood was the most common building material. Hence disastrous fires could spread very easily, and several times they wiped out entire sections of the village. Brick construction prevails to-day, with native white brick predominating in the case of older houses.

In pioneer days merchants and artisans used their dwellings for a double purpose—as living quarters and as workshops or

Above:—Photo 11—A first-class home in North London

Photo by S. G. Hueston

Top right:—Photo 12—The home of the late Sir Adam Beck in North London

Photo by S. G. Hueston

Centre:—Photo 13—A neat little house in a new quarter of southeast London

Photo by S. G. Hueston

stores. With increasing prosperity and turnover, however, buildings along Dundas and nearby streets began to serve only commercial or industrial purposes. Land values rose and the spaces between buildings disappeared. Owners of businesses then erected their homes along the fringe. The well-to-do turned towards the north or went over the river to the south, while those less successful settled in the southeast; and thus arose a differentiation that has persisted to the present day (Photos 11, 12, 13). Queen's Avenue, Dufferin Avenue, the Victoria Park area, and parts of Talbot Street North were for a time exclusive residential sections. With further prosperity and the occupation of all available lots, first-class residential growth continued its course towards the north, where the mansions of the wealthy occupy select spots within the city or choice suburban sites. Yet second-class and third-class homes have also established themselves in the north, although localities devoted exclusively to more modestly priced houses have sprung up mainly in the eastern parts of the city, usually next to the manufacturing plants. Our present housing shortage has encouraged the conversion into apartments of residences situated near the com-

Right:—Photo 14—The Court-house

Photo by S. G. Hueston

Photo 18—Arts Building of the University of Western Ontario

Photo by William Beattie

mercial core. The largest apartment houses are found at the corner of Queen's Avenue and Wellington Street.

London began life as an urban centre with a population of 10,060. Immigration from abroad and natural increase raised the figure year by year. The 1941 Dominion census showed that 78,264 people lived within the corporate limits and an additional 8,476 in the adjacent unincorporated communities. Of late, other factors have played their part in producing a consistent annual increase of at least a thousand.

The demand for shelter has outgrown the number of dwellings, which is in the neighbourhood of twenty-three thousand—at least one thousand too few. Since a serious housing famine prevails throughout the nation, the Dominion Government is supporting the building programme. Private enterprise is taking a hand also, as well as carrying on with its own schemes so far as materials are available. These projects offer a definite challenge to intelligent planning.

Institutions

Since regional needs can best be served from a central position, institutions of various sizes and types have entered the London land-use pattern. The Courthouse gave the settlement its start (Photo 14). Near it stand the County Building and the Registry Office, while to the northeast, on Richmond Street, the Dominion Public Building dominates the skyline, ornamental in its modern architectural beauty; this is used for the distribution of mail and the collection of customs duties and excise taxes (Photo 15).

The rebellion of 1837 helped London too, for shortly afterwards British regiments arrived. Victoria Park marks the spot where

Photo 19—Victoria Hospital

Courtesy London Chamber of Commerce

their wooden barracks stood. The sports and social events of the garrison added colour and life to the community, while the money spent by officers and men increased the turnover of the merchants. London is the headquarters of Military District No. 1.

St. Paul's Cathedral replaced a frame church burned down in the fire of 1844. Its rector became bishop when London was made the headquarters of the Diocese of Huron. Similarly, the Roman Catholic Church has looked upon this city with favour, naming it the See of London and establishing therein its educational and charitable institutions. St. Peter's Cathedral stands out prominently because of majestic proportions and beauty of detail (Photo 16). Other religious bodies have likewise carried on their forms of worship since pioneer days, and still play a vital part in the city's spiritual life.

We find the usual primary and secondary schools, business colleges, a technical school, and a normal school. The London Public Library lends admirable support to the cause of education by encouraging a wide reading public and by sponsoring art displays, musical performances, and lectures on national and social problems (Photo 17). From a hill to the northwest, just outside the municipal limits, the University of Western Ontario overlooks the Forest City. Full advantage has been taken of the well-chosen site for the creation of a beautiful campus. The architecture is modified collegiate Gothic, with an impressive tower on the Arts Building (Photo 18).

The Medical School is not on the campus but across from Victoria Hospital on South Street, which position provides opportunity for direct study of human ailments (Photo 19). Some of London's medical men have gained international reputations.

Economic Activity

Before the days of railroads, the lumber of southwestern Ontario could not be carried to Montreal, and so satisfied mainly local needs. London's lumber came from its own sawmills or down the river from Dorchester. An occasional raft went farther downstream and out through Lake St. Clair. The so-called "black salts" obtained from wood ashes by leaching were an important article of trade. Farmers dumped the ashes they got from clearing the land into an ashery on Dundas Street. Usually they received store goods in exchange—cash, too, if they so wished.

Wheat took the place of "black salts" as a commercial staple when improved transportation provided access to European markets. Considerable quantities were turned into flour at the local mills for local consumption. One miller got his power from Carling's Creek; others dug their mill-races along the edge of the Thames River.

The first settlers tended to be largely self-sufficient. As the settlement kept pace with the rapid strides made by Upper Canada its craftsmen took over many of the jobs which

Photo 20—The industrial quarter south of the central business section
Courtesy London Chamber of Commerce

Photo 21—A prominent industrial plant extending along the interswitch in London East
Photo by A. A. Gleason

Above:—Photo 26—Several wholesale houses near the railway Photo by S. G. Hueston

the farmers had hitherto done for themselves, often accepting farm produce as payment. Their trade was based on the resources of London's hinterland. Soon they had other activities besides the sawing of lumber and the grinding of wheat. Tanners and brewers could depend on local raw materials, but the tinsmiths, wagon-makers, and carriage-builders had to have theirs hauled by wagon from Hamilton or Port Stanley.

Railway transportation fostered the growth of the city and its back country. Small industries became larger and larger, both in number and size. Descendants of the founder in some instances continue to turn out the same product on the original site (Photo 20), though the trend is towards the tracks and interswitch in London East (Photo 21). Since coal must be imported, manufacturers avail themselves of cheap electricity. London was the home of Sir Adam Beck, whose greatest contribution to public service was the establishment of Ontario's hydro-electric power system at Niagara Falls.

The market expanded to include not merely the region, but much of Ontario, and then the Dominion. Besides disposing of large quantities on the domestic market, London manufacturers now ship their goods

Top to bottom:—

Photo 22—Richmond Street, looking south. Note the intersection with Dundas Street
Courtesy *London Free Press*

Photo 23—King Street, looking east, with Covent Garden Market at the left.
Courtesy London Chamber of Commerce

Photo 24—Looking west along Dundas Street; Hotel London at the left and Municipal Offices at the right. Photo by S. G. Hueston

Photo 25—The business section of London East
Photo by S. G. Hueston

to the world at large, receiving, in turn, both finished articles and raw materials. They make engines, boilers, furnaces, stoves, refrigerators, radios, agricultural implements, dairy products, confectionery, beer, chemicals, shoes, hosiery, and numerous other things. Since diversity is responsible for the steadiness of industrial growth, neither boom nor depression can exert too marked an effect.

For one reason or another, several industries once prominent have passed out of the picture. Oil refineries that obtained their crude oil from fields fifty miles west carried on their work in the second half of the nineteenth century along the Great Western tracks in London East. Lamp oil and lubricants were shipped to the European market. Exhaustion of the resource meant the death of London's refining industry. The very easternmost section of the city, Pottersburg, owes its name to the manufacture of salt-glaze stoneware from imported clay. Pianos and cigars are two other London items that no longer bring in much money.

When the settlement was in its infancy, traffic entered by way of Westminster and Blackfriars bridges, thus making Ridout Street, which runs close to the forks, the main business highway. Stores, workshops, banks, and Court-house were located on or near this street. Richmond Street connected with the road to the north, while Dundas Street opened up the way to the east for supplies from Hamilton. These now form the main intersection, though activity around the Municipal Offices and Hotel London, two blocks farther east, is increasing more and more (Photos 22, 23, 24). London East had an independent origin, and hence a commercial centre of its own (Photo 25). Outlying business cores along Hamilton Road, Wharncliffe Road, and Richmond Street meet with opposition whenever they threaten to encroach on purely residential areas.

As second largest wholesale centre in Ontario, London stands next to Toronto (Photo 26). Its trading area extends 55 miles to the east, 25 to the south, 65 to the west, and 75 to the north, thus enclosing such important communities as Brantford, Galt, Woodstock, St. Thomas, Chatham, Sarnia, Stratford, and Kitchener.

In our day Londoners are weighing all the implications of travel by air (Photo 27). A century ago they were already concerned with transportation. Through the efforts of their member of parliament, roads were improved with new surface, bridges, and better drainage. Despite toll-gates, these improvements pleased not only the farmer who had to go to town but also the stagecoach driver and his passengers. This road system was the forerunner of Provincial Highways 2, 4, and 22 (Fig. 6).

In 1853 the citizens welcomed their first train, on the tracks of the Great Western Railway. To-day Canadian National Railways is in charge of this as well as of the St. Marys stub line, constructed by the Grand Trunk. Its new station was com-

Photo 27—London City Airport
Courtesy *London Free Press*

Photo 28—The Canadian National Railways Station
Courtesy London Chamber of Commerce

pleted in 1936 (Photo 28). When the Canadian Pacific Railway entered London in 1887, it brought the advantages of competitive freight rates and access to the rapidly developing markets of Western Canada. Civic-minded men saw the need of an interchange track, and by 1904 had succeeded in obtaining an agreement on one for the eastern part of the city.

The locomotive puffing along the Great Western Railway tracks aroused such enthusiasm that Londoners were easily persuaded to build a railroad of their own, which gave them a lake outlet at Port Stanley, twenty-three miles away. Through the port came coal and iron for the manufacturer, and from it went the products of the farm. It had connections with Montreal and with several United States points across Lake Erie. Electrification brought an added stimulus to those fond of dancing, boating, or swimming at London's lakeside resort.

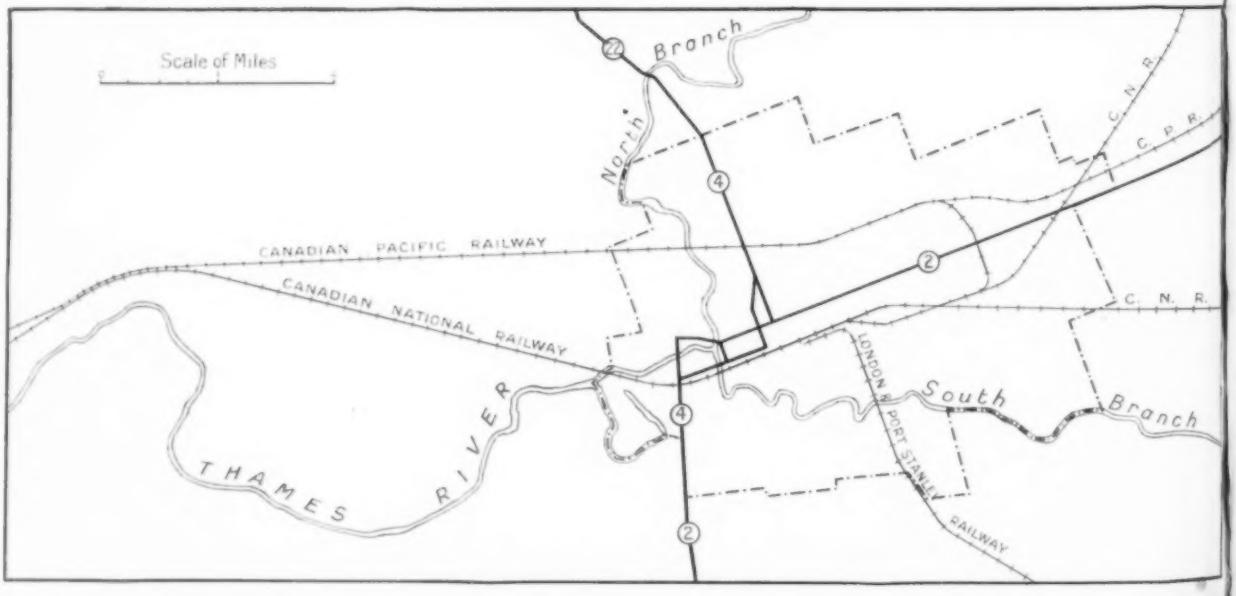
The Thames River served as highway for the Indians, but for the white settlers it was only of minor importance. Boats ran from Chatham out into Lake St. Clair, and west of the forks excursion steamers took merry-makers from London to Springbank Park, until the foundering of the *Victoria* in 1881, with the loss of many lives, turned the public against water transportation.

Plans for Improvement

London, Ontario, became town-planning conscious more than a quarter of a century ago when its city council offered to share with the Dominion Government the cost of large-scale maps. The Geodetic Survey prepared these on a 1/1,000 scale, with a contour interval often smaller than 2.5 feet. A little later a prominent planner was engaged to prepare a town-development report, which, after its completion by a different man, the citizens discussed at various public gatherings. Activity then died down, but was revived again in 1945.

Accurate maps are now at hand, to be sure, and London is fortunate in that respect. Yet urban growth is a complex thing. Planning presupposes a thorough knowledge of past and present development, both as to character and extent. The marks of haphazard growth must be erased, and the channels of future growth defined with respect to possibilities of site, needs of the inhabitants, changing standards, increase in population, and expansion of public services. Above all, the total unit idea must prevail, lest one part be permitted to flourish and another to decay. These and like considerations are guiding the Town Planning Commission in the drawing up of a master plan, which it regards as its first and most important duty.

Fig. 6.— The Canadian Pacific and the Canadian National Railways have played an important part in London's development by bringing in raw materials and giving access to outside markets. Numerous trucks, buses and automobiles make use of a network of provincial and municipal highways. The traffic of Nos. 2, 4, and 22 is dispersed along different streets within the mid-city shopping district. Passengers for American or Canadian centres board the large planes of the Trans-Canada Air Lines at the Crumlin Airport east of the city.



The Scilly Isles

Flower Garden of England

ABOUT twenty-seven miles to the southwest of Britain's westernmost point, Land's End—the narrow piece of land that juts out into the Atlantic—is a little group of rocky islands. Between them and the mainland the sea rages so stormily that it is sometimes impossible for a boat to reach them. But in the early spring, towards the end of January, a little steamer begins regularly to toss its way across the sea, carrying a precious, fragile cargo. Between thirty and forty tons of freshly picked flowers—daffodils and narcissi, ranging from loveliest gold to brightest sunshine yellow—are carried to the mainland every trip.

It was about 1870 that Augustus Smith, then Lord Proprietor of the Scilly Isles, made the discovery that because of the mild, damp climate, the narcissi which grew wild on the islands bloomed several weeks earlier than those on the mainland, in Holland, or on the Channel Islands. Now nearly ninety per cent of the 1,800 inhabitants make their living out of the profits of flower cultivation. The flower farms, which are fairly small and can be managed by individual families, are handed down from father to son. All these farms together make up the Scilly Isles Bulb and Flower Organization, which was founded in 1895 and is probably the oldest federation of flower-growers in the world.

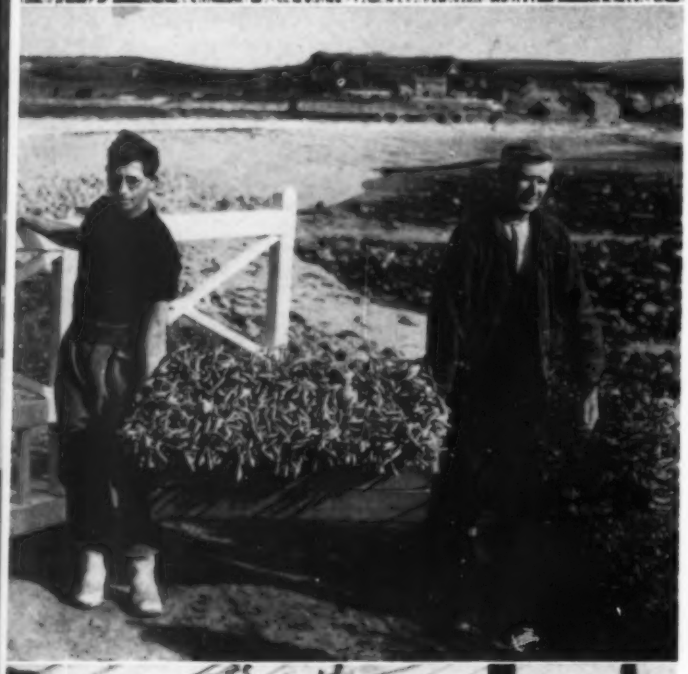
The flowers are grown in laid-out flower gardens. Research workers investigate the problems connected with their growth, and there are about sixteen experimental plots on which different methods of cultivation are tried out. "Solidors" (the correct spelling, now discarded by the islanders, is "soleil

Top to bottom:—A view of the Scilly Isles as they are seen when approached by air. Note the orderly flower gardens.

Experimental plots on which different methods of flower cultivation are tried out. There are sixteen of these. The islands' mild, damp climate causes daffodils and narcissi to bloom very early in the year.

Dr. Gregory, who is in charge of scientific research in connection with flower growing, sprays a bed of flowers. "Fortune" narcissi are the latest result of scientific cultivation.

Close-up of a "Fortune" narcissus



d'or") are a variety of narcissus in which the growers specialize. But "Fortune" narcissi are the finest flowers grown on the Isles. They are the latest result of scientific cultivation.

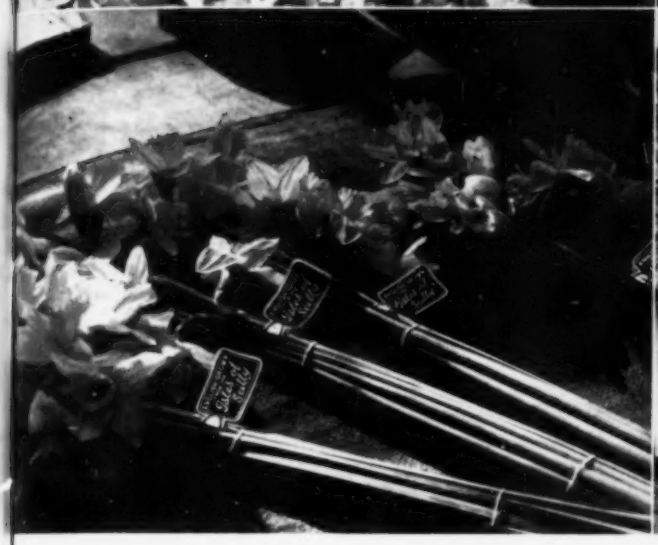
The flowers are picked before the blooms are fully out, so that by the time they reach Covent Garden—London's flower market—they are at their best. Skilled pickers—islanders who have grown up among these flowers—gather the blooms and carry them on large trays to the sheds where they are packed ready for travelling. First they are stood in pots filled with water; "giving them a drink", this is called. Then they are tied in bunches and labelled to show that they are the produce of the Scilly Isles. The work of bunching and labelling keeps whole families busy all day. Freshly picked flowers need immediate attention—they must not be left even for an hour. Finally, they are carefully packed in boxes.

The Isles' own steamer, the *Scillonian*, is loaded at St. Mary's, the largest of the forty or so islands. It is loaded from both sides. To its sea side, launches bring in boxes of flowers from the smaller islands. And to the quay come boxes from horse-carts and motor-cars. Visitors to the Scilly Isles can

Top to bottom:—The flowers are picked—by skilled and efficient islanders, who have grown up among them—before they are out in full bloom; this allows time for packing and transport.

With the sea in the background, pickers are seen carrying a tray of flowers fresh from the fields to the sheds where they are packed ready for shipment. Over 1,100 tons of flowers are exported annually.

"Giving them a drink"—that is what the islanders call this process. The flowers, just after picking, are taken to sheds and stood in pots, in water, before they are tied



Top left:—A mass of flowers—mainly narcissi of the "Solidor" type in which the island growers specialize—on the bench, ready for bunching and packing. Nearly 90 per cent of the Isles' inhabitants earn their living by flower cultivation.

Top right:—The work of labelling and tying bunches of flowers keeps whole families busy all day long. Freshly picked flowers need immediate attention and must not be left unattended, even for an hour.

Above:—"English grown—from the Isles of Scilly"; this is the label which is tied onto the stems. It guarantees that the flowers are genuine products of "England's Flower Gardens".

Above:—These flowers are packed in boxes in such a way that they will not be crushed, however roughly handled the boxes are on their journey to Covent Gardens, London's flower, fruit and vegetable market.

also make the three-hour voyage from the mainland in the *Scillonian*, but it is possible to travel by air, taking only twenty minutes. The "Flower Train" to London runs three times a week from Penzance station.

When the islands first began to cultivate flowers, they exported 65 tons annually. Now, between 1,100 and 1,200 tons of flowers are sent away each year. Even when she was helping to fight the grimmest war in history, London still received early spring flowers.

The Scillonian, *the Isles own steamer, being loaded from both sides. On the right, a launch brings in flowers from the smaller islands. On the left, on the quay, boxes are loaded from horse-carts and motor-vans.*

Right:—A view of British Columbia orchards near Vernon. The high quality of British Columbia fruit is known from coast to coast in Canada, the United Kingdom and the United States.

Left:—Before the war Nova Scotia held an annual Apple Blossom Festival. Here is one of the Queens of that interesting event.

Centre left:—Blanching celery in a market garden.

Centre right:—A choice batch—and we're not referring to the fruit alone. These farmerettes are shown on a fruit farm in the Niagara Peninsula, where hundreds help each year to harvest the delicious fruit.

Canadian Trade in Fresh Fruits and Vegetables

by W. C. HOPPER

THAT "there are two thousand years of civilization in a bowl of soup" is probably a true statement, particularly if it refers to vegetable soup; for the vegetables we consume each day are the descendents of wild plants discovered many centuries ago. As a result of scientific breeding and selection and modern cultivation and fertilization, twentieth-century vegetables are superior in every respect to their far-away ancestors. The fruit salad you make to-day also represents centuries of growth—from the wild, puny, unattractive ancestral fruits to their luscious vitamin-rich descendents.

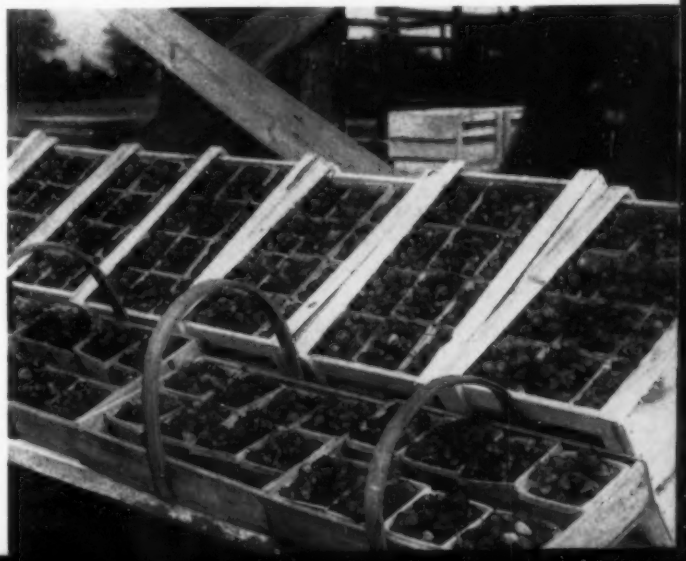
Fruits and vegetables in your favourite retail store are not only the results of scientific achievements over a long period of time, but also reflect the wonders of modern transportation, which make it possible to bring the products of gardens and orchards in many parts of the world to the retail stores in our Canadian cities.

Just prior to the war, studies were made by the Economics Division of the Dominion Department of Agriculture of the marketing of fresh fruits and vegetables in several Canadian cities—including Toronto, Ottawa Montreal and Quebec. These studies showed that oranges from not only California and Florida but also South America, Italy, Palestine, Spain, the West Indies and South Africa were received in these Canadian cities. Pineapples, limes, lemons, grapefruit, bananas, potatoes and garlic from the West Indies, tomatoes, melons and peas from Mexico, and onions from Egypt, Spain, South Africa and Australia were among the wide variety of products obtained. Twenty different countries outside of Canada and the United States furnished fresh foodstuffs to the people of our cities. War conditions stopped the importation of some of these products, but the quantity and variety may eventually be even greater than in pre-war days.

The production and distribution of fresh fruits and vegetables to feed the people of Canada is to-day a huge and complex business involving thousands of farmers, market gardeners, and fruit growers; thousands of city people, such as wholesalers and jobbers, retail storekeepers and their helpers; and thousands of motor-trucks, railroad cars and boats.

What a void it would make in our daily supply of food if we had no apples, grapes, peaches or strawberries, no potatoes, cabbages or carrots, or other kinds of commonly used fruits and vegetables; that would indeed be serious, for these form a substantial proportion of our daily food supplies. During the year 1944, each Canadian civilian consumed, on the average, about 214 pounds of potatoes, 42 pounds of tomatoes and tomato products, 142 pounds of fresh and canned fruit and fruit juices, and 103 pounds of fresh and canned vegetables.

As a result of the increase in population and the growth in knowledge of the value of these commodities in the diet, there has been a great increase in the demand for



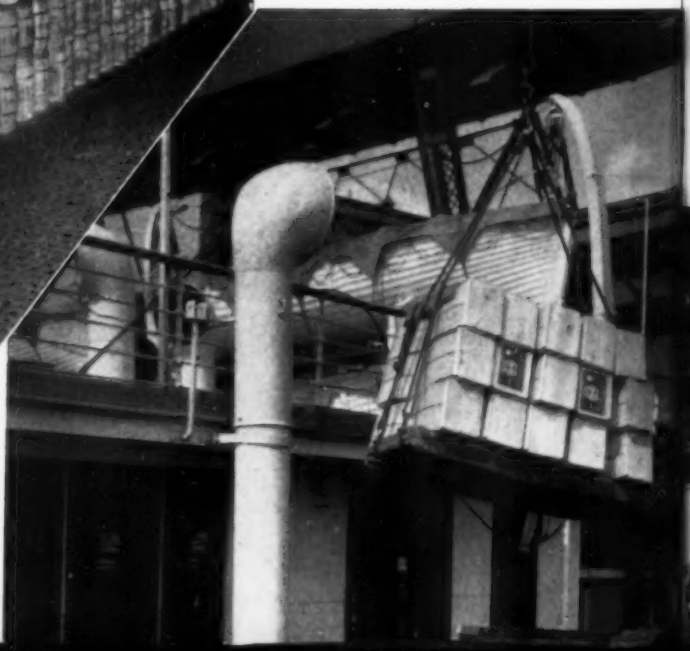
Choice strawberries being crated for shipment —Vineland, Ontario. The berries are rich in Vitamin C, so essential to a well-balanced diet.

Left, bottom:—Apple trees in blossom in Nova Scotia. The beauty and fragrance of the blossoms in apple-growing regions of Canada attract not only bees and other insects but human beings as well.

Left:—Interior of an apple-packing plant in British Columbia

Right:—Unloading Canadian fruit at Liverpool, England.

Left: — Barrels of Canadian apples ready for classification in a Liverpool shed



Right:—A cargo of Canadian fresh fruit (Niagara District pears) being transferred from the sheds of the Cunard Line at Montreal, Quebec, to the S.S. Ansconia— *bound for Great Britain.*

fruits and vegetables during the last decade or two. In response to this demand, there has been a marked increase in the production and importation of these foodstuffs.

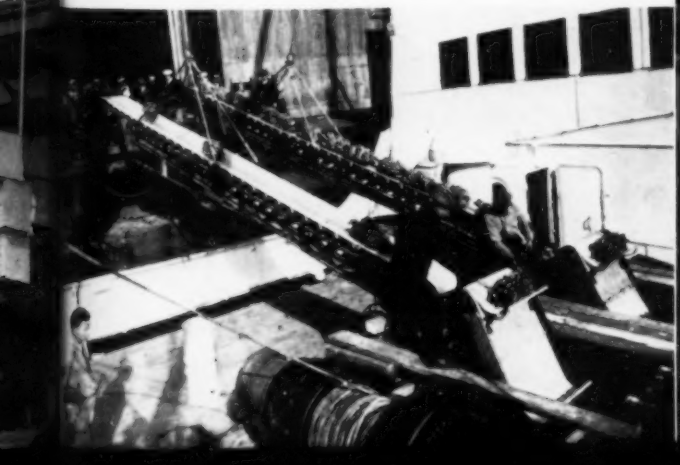
Readers who have reached middle age will remember that not so long ago the family table, during most of the year, had few fruits and vegetables, with the exception of potatoes, turnips, apples, and perhaps some carrots, beets and cabbage. Oranges were associated with Santa Claus, and bananas were purchased only when the school teacher or some other important guest came to dinner. City fruit and vegetable retailers consisted of a few green grocers who depended largely on the higher-income families for their customers. Now look at the situation to-day. Practically every one of the thousands of grocery men carries a supply of fresh fruits and vegetables the year round, and in every city there are many stores which sell little else but these products. The development of cold-storage facilities, of the refrigerator-car, motor-truck transportation and good highways, has made it possible to increase immeasurably the supply of these commodities. One has only to visit a large fruit dealer to realize the complexity of the trade in fruits and vegetables; for example, fifty different kinds were received in the city of Montreal in 1937.

Because the city consumers of Canada are now accustomed to fruits and vegetables the year round, they would find it difficult to arrange their daily menus without the products grown in and shipped from the United States. Each year some 36 states of the Union send these vital food materials to our cities. Imports from the United States amount in import value to 60 or more million dollars annually. At retail prices, these commodities would be worth possibly 75 to 85 million dollars. Almost every conceivable kind of fruit and vegetable is included in

Examining Ontario peaches. Government inspection and grading services help to provide consumers at home and abroad with high-quality fruits and vegetables.

Right:—Large quantities of melons are imported annually from the United States.

Below:—Bananas being unloaded from a ship in Montreal; Canadians are very fond of this fruit.



Left:—Part of the growers' section of the Ottawa public market, better known in the Capital as By-ward Market. Farm products valued at more than one million dollars are sold on this market annually.

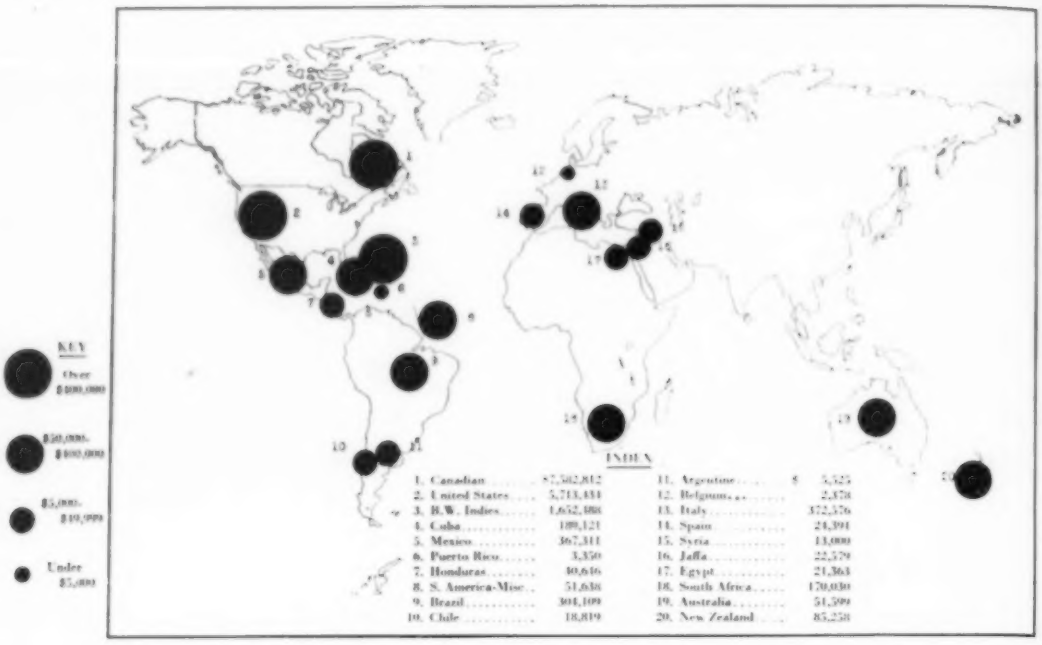
Right: — Locally grown cauliflowers sold by these attractive salesladies draw many customers on the Ottawa public market.

Left:—Display of an individual market gardener. Vegetables like these are a rich source of vitamins and minerals, so necessary in our every-day diet.

Right:—The Hamilton, Ontario, public market is one of the largest outdoor fruit markets in Canada. Being close to the fruit-producing areas, it is able to offer a great variety for sale.

Left:—This picture of the present Bonsecours Market in Montreal gives some idea of the congestion on market days in the producing season. A new wholesale market is being planned to take care of the increasing volume of local fruits and vegetables.

Right: — Bonsecours Market in the horse-and-buggy days (cf. modern view above). It is now more than one hundred years old.



Origin of all fresh fruits and vegetables unloaded in Montreal in 1937.

the annual receipts from our great neighbour to the south.

The total value of fruits and vegetables grown in Canada reaches into the 100 million-dollar mark annually. These commodities are grown commercially in every province of Canada, and products from most, if not all, of the provinces enter inter-provincial trade each year. In cities like Montreal and Toronto, fruits or vegetables from at least seven of the nine provinces may be found.

Only one who has been a grower or distributor of these commodities can appreciate the technical knowledge of production, handling and selling required, the amount of work involved and the care necessary to bring to the consumers' tables fruits and vegetables which they will eat with satisfaction and relish.

The wholesale value of all the imported and Canadian-grown fresh fruits and vegetables sold annually in Toronto is in the neighbourhood of 15 to 20 million dollars and amounts in volume to about 500 million pounds. The annual wholesale value of these foodstuffs laid down in Montreal is approximately 20 to 25 million dollars and represents 800 million pounds. The value of similar commodities received in each of the cities of Ottawa and Quebec exceeds 2 million dollars yearly.

If the quantities of fresh fruits and vegetables received and largely consumed annually in the two cities of Toronto and Montreal were piled in a column 50 feet square, the top of the pile would be lost in the clouds, 20 or more miles from the earth. This gigantic stack of food would contain more than 10 million 6-quart baskets, 4 to 5 million bushel baskets, about the same number of 75 and 100-pound bags, and the balance would be made up of bags, baskets, cartons, crates, boxes, sacks, drums, lugs and kegs of various sizes filled to the brim with all manner of products from the orchards, groves, farms and gardens of the world. This tremendous column of fresh food would also contain nearly 1½ million stems of bananas (before the war) and millions of bunches of carrots, beets, parsnips and other smaller vegetables.

In the distribution of Canadian-grown fruits and vegetables the public markets of our Canadian cities play a very important role. Here millions of dollars' worth of produce changes hands every year. It would indeed be a difficult task to provide other adequate channels through which farmers could reach city consumers if for any reason the public markets were to cease to operate; it is impossible even to conceive of such a situation, since they are so important in

the distribution of perishable farm products.

The public market is a long-established institution in Canadian cities. Quebec City has had a public market since 1649. Montreal's Bonsecours Market and the St. Lawrence Market in Toronto, which are still operating, were established in 1803. The Ottawa By-ward Market was founded in 1850. Of the public markets in twenty-two Ontario cities, nineteen were founded more than fifty years ago. Thousands of farmers and growers specializing in the production of vegetables and fruits sell their products on the public markets of our Canadian cities.

In pioneer days farmers grew produce to supply the needs of their own families, but as agricultural implements were improved, resulting in a surplus above that required at home, they began taking farm commodities to the nearby villages, and special places were set aside on the village streets where farmers could meet their village customers. Later, as villages grew to cities, these were enlarged to meet the needs of the increased numbers of buyers and sellers.

Improved public market facilities are now urgently needed in many of our Canadian cities, as markets are likely to continue to play an essential part in the distribution of Canadian-grown farm products.

Every morning we wake up and demand food. At our breakfast table most of us want fruit or fruit juice, at dinner we want potatoes and other vegetables, as well as meat, while the practice of having a salad for lunch or supper is becoming more and more common. Without fruits and vegetables our diets would be lacking in certain of such essential food elements as vitamins and minerals, vital substances which are needed at all times to ensure health. Fruits and vegetables are classed as "protective" foods by nutritionists, and a wider use of them by the lower and medium-income households is being widely advocated. The production and distribution of these commodities is "big business"—one which will probably grow in importance with the years.

Well-stocked shelves of canned fruits and vegetables offer nutritious food for winter menus.

Most cities now have retail stores which specialize in fruits and vegetables. To many Canadians a diet without these foods would indeed be monotonous and unpleasant. Retailers like this one play a most important role in the distribution of fresh foodstuffs to urban consumers.

LIVERPOOL—City of Ships

by LIVERPOLITAN

EIGHT YEARS before he was forced to sign Magna Carta in 1215, King John granted Letters Patent making Liverpool a free borough. Throughout the ensuing 700 years, the port has been an important factor in the economic life of Britain, and never more so than in the war years just ended.

At a time when the English Channel was "the best anti-tank ditch in the world" few ships could enter London or Southampton, and men, food and munitions poured into Britain from the west, largely through the port of Liverpool.

During 68 months of war the port handled over 70 million tons of cargo, including 660,000 tanks and vehicles, 74,000 aeroplanes and gliders, and 19 million tons of food. Three and a half million British and Empire troops and 1,200,000 American troops also passed through the port. The docks of Liverpool, managed by the Mersey Docks and Harbour Board, are world-famous, and extend for seven miles along the river. They have a linear quayage of 29 miles, while the Birkenhead dock system across the river has another nine miles of quays.

At the centre of this seven-mile stretch of docks the citizens have their own river frontage at the Landing Stage, the largest

At top:—Lord Street, South Castle Street and Paradise Street areas—after the air raids of 1941

Photo by Stewart Bale Ltd.

floating structure in the world. It is half a mile long, and consists of a wooden stage supported by about 200 iron pontoons, each 80 feet long, 10 feet wide, and 6 feet deep. The stage is connected to the river wall by ten bridges and numerous booms, each hinged at either end.

Ocean-going vessels come alongside the Landing Stage at all tide levels on their arrival at, and departure from, the port, to embark and disembark passengers and mail.

Within a stone's throw of the Town Hall there is an unfinished block of offices, the entrance to which was rigorously, though unobtrusively, guarded throughout the war. Deep underground, below this building, was one of the most vital nerve centres of the allied war effort—H.Q. Western Approaches. From the operations room here all the Allied Forces employed in the fluctuating "Battle of the Atlantic" were directed and controlled, and on a huge wall chart the Flag Officer could see the course of every convoy and the probable position of enemy vessels.

It should not be thought that Liverpool is notable only as a port. In commerce it holds a leading position in the United Kingdom, and it is the acknowledged headquarters for corn and cotton dealings. The commodity markets are internationally famous, and the wheat "futures" market was one of the world's most important.

Incidentally, the members of the Liverpool Corn Trade Association now meet daily in Fenwick Street in front of the ruins of their blitzed exchange.

Within the last two generations Liverpool's industries have developed considerably, and it is now one of the largest centres of flour milling, ship building and repairing, oil and seed crushing, tobacco storage and processing, sugar refining and tanning. Of late years there has also been a marked increase in the number of light industries in

Port of Liverpool—peacetime view of Pier Head Buildings on the river-front. Premises occupied by shipping and other companies are shown in the background.

Photo courtesy Mersey Docks and Harbour Board, Liverpool

View over South Docks from the Royal Liver Buildings
Photo by E. Chambre Hardman, F.R.P.S.

the City—a development which should do much to ensure an even level of prosperity in a district which was, at one time, rather too dependent on its shipping industry.

The City Council is fully alive to the importance of maintaining and improving Liverpool's position as an industrial centre, and has already developed two great industrial estates at Speke and Fazakerley. Here the City has acquired large tracts of land, and industrialists are offered every facility for factory development on well-serviced sites.

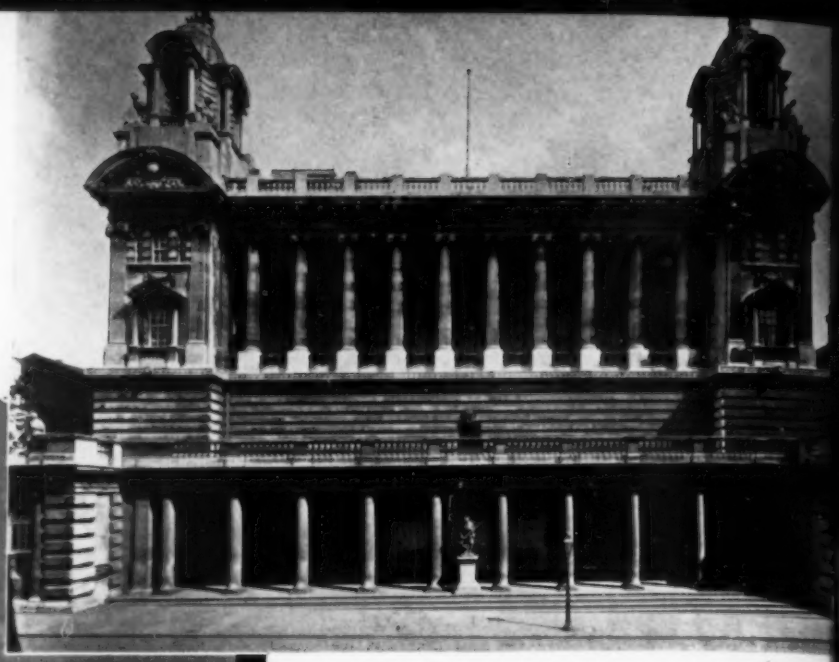
During the war huge engineering and munition plants were erected by the Government at Kirkby on the City's northeast boundary, and the City Council has recently agreed to lease this 35-million-dollar estate from the Government for further industrial development.

Since 1901 the population of Liverpool has increased by 350,000 and the City has been faced with many problems arising out of this increase. Until 1919 the housing of the people was a task left largely to private enterprise, but after that date much wider powers were granted to local councils, with the result that, in the twenty years between the two wars, over 39,000 houses were erected by the City Council, and to-day about 15 per cent of the population lives in dwellings built by the City. Unlike those resulting from some mass housing projects, these houses are of good design, sound construction and pleasing appearance. Near the central area of the City several large blocks of working-class apartments have been built; here again, the design and construction have been such as to attract visitors from all parts of Europe and America.

Considering its 700 years of continuous existence, the City has comparatively few architectural links with the past, and the air raids of 1940 and 1941 took heavy toll of

The Cotton Exchange

Photo by Stewart Bale Ltd.



Left: — Water Street, showing Liverpool Town Hall (centre background).

Photo by E. Chambre Hardman, F.R.P.S.

Below:—St. George's Hall, which houses the Courts of Justice.

Photo by Stewart Bale Ltd

Above:—St. Andrews Gardens (municipal flats), showing playground through the archway.

Photo by Stewart Bale Ltd.

Right:—Spike Road Gardens (municipal flats)—view across the central court

Photo by Palatine Studios

Below:—Another view of Spike Road Gardens

Photo by Palatine Studios

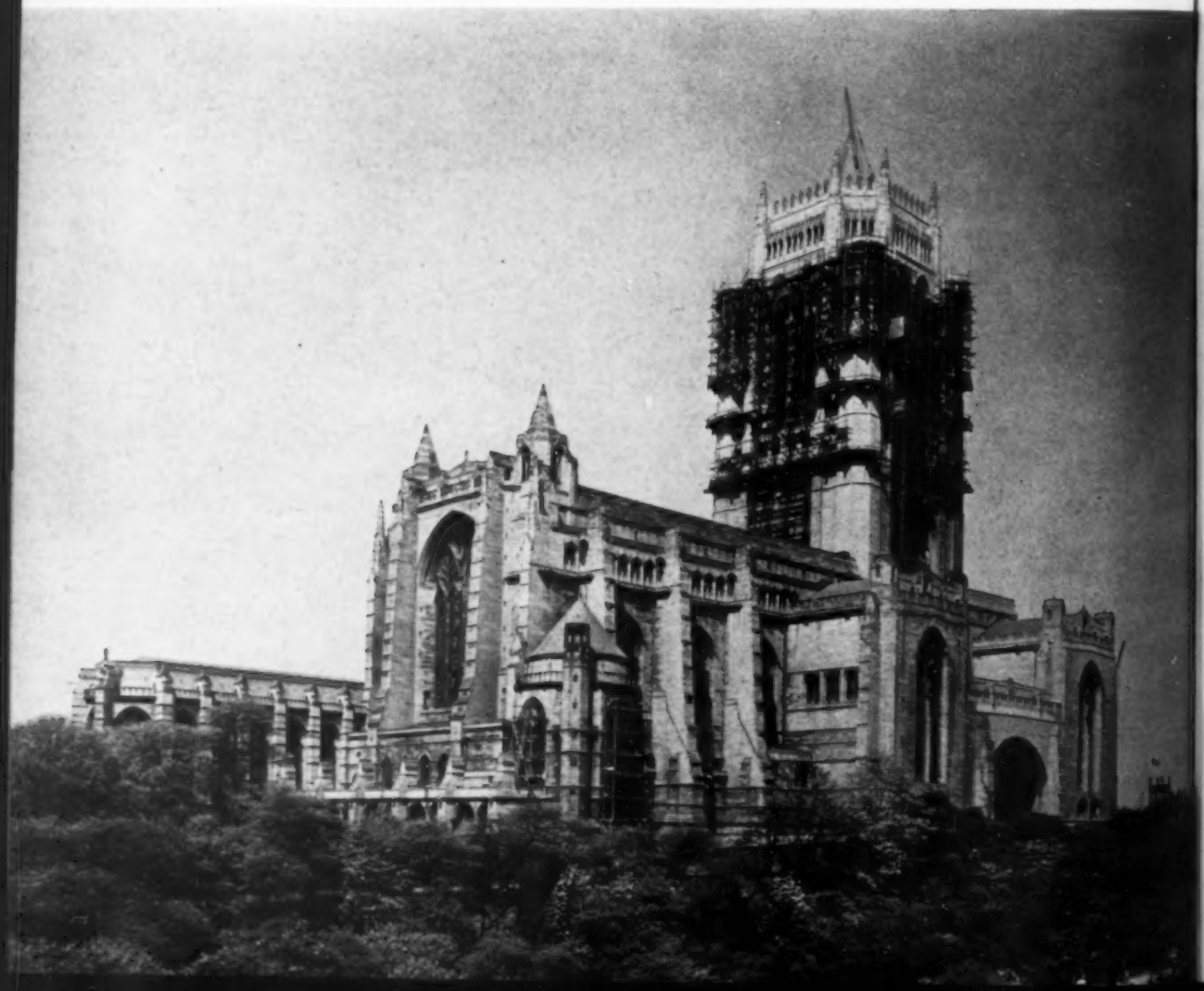
those that did remain. The Church of St. Nicholas at the Pier Head was built in the fourteenth century, and parts of St. Mary's at Walton dated back to the twelfth century, but each now stands as a gaunt reminder of the fury of the Luftwaffe.

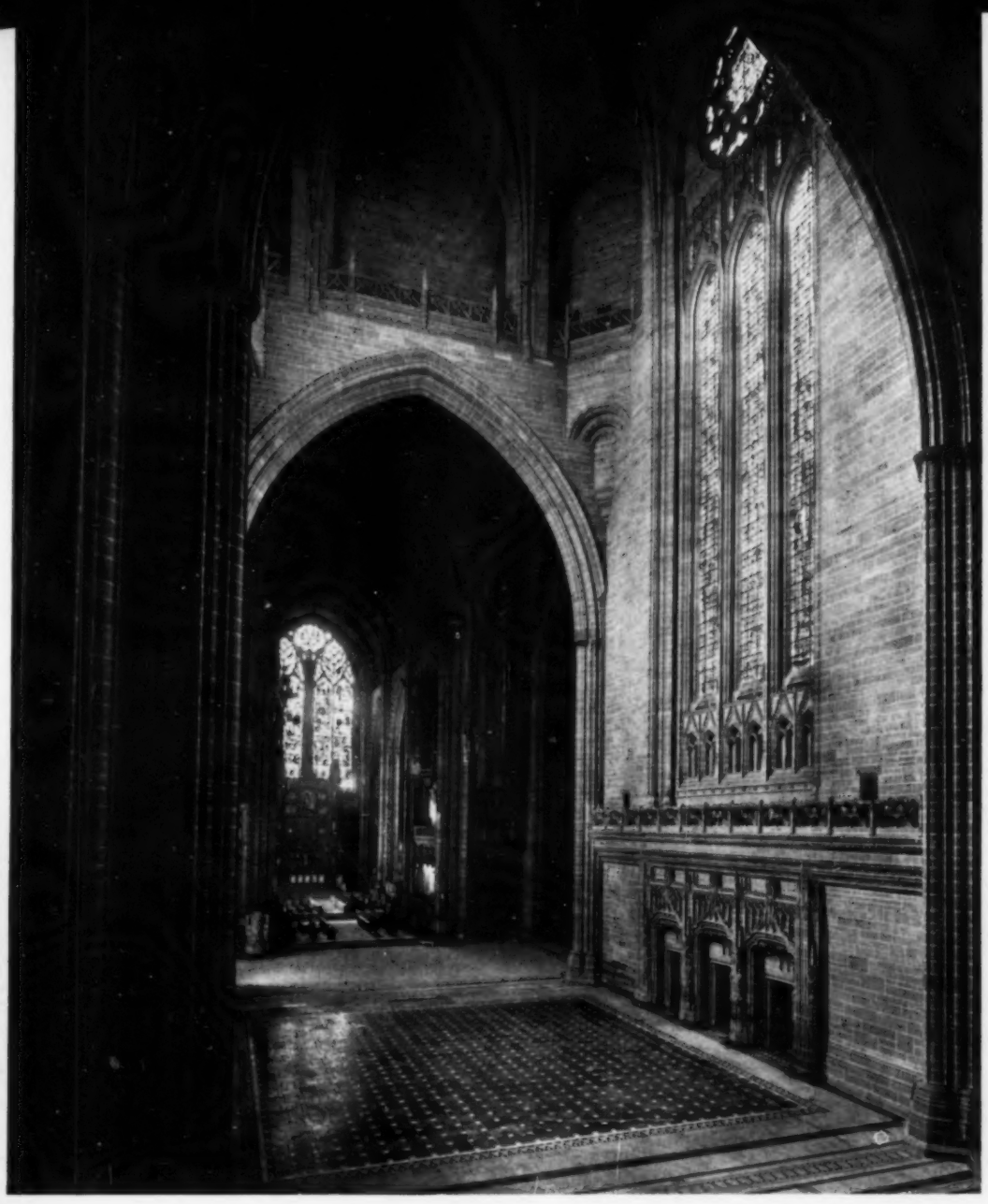
The Town Hall, designed by Wood, and completed in 1754, is more notable for the grace of its rooms than for its outstanding exterior. The ball-room is a fine example of the Adams style of decoration and possesses three magnificent chandeliers.

Probably the most familiar building in Liverpool is the St. George's Hall. The foundation stone was laid in 1838 and the building completed in 1854. It is classic in style with a portico of sixteen Corinthian columns, about 60 feet in height. The Great Hall is remarkable for the richness of its decoration, and the building includes the Assize Courts as well as a smaller Concert Hall.

Liverpool Cathedral is not yet completed, though the foundation stone was laid by Edward VII in 1904. It is built of red sandstone quarried within the city limits, and was designed by Sir Giles Gilbert Scott, R.A., who won the public competition while in his early twenties. The Cathedral is magnificently situated on St. James' Mount, and its 300-foot tower dominates the City and surrounding country-side. When completed this will be one of the largest churches in the world and, although it is Gothic in style, many authorities feel that the architect has succeeded in combining the modern

Liverpool Cathedral Photo by Stewart Bale Ltd.





Liverpool Cathedral—an interior view Photo by Stewart Bale Ltd.

urge for simplicity with the mediaeval tradition of devotional craftsmanship. Some of the masons engaged on this building have spent their entire working lives on the task, and few people who saw the foundation stone laid can hope to see the work completed. In 1941 the Cathedral narrowly escaped major damage and one bomb, which pierced the roof, passed through a transept window to explode above the street outside, causing only superficial damage. The Lady Chapel, a building of singular beauty, was more seriously damaged in another air raid, but it is good to know that the harm done is not irreparable.

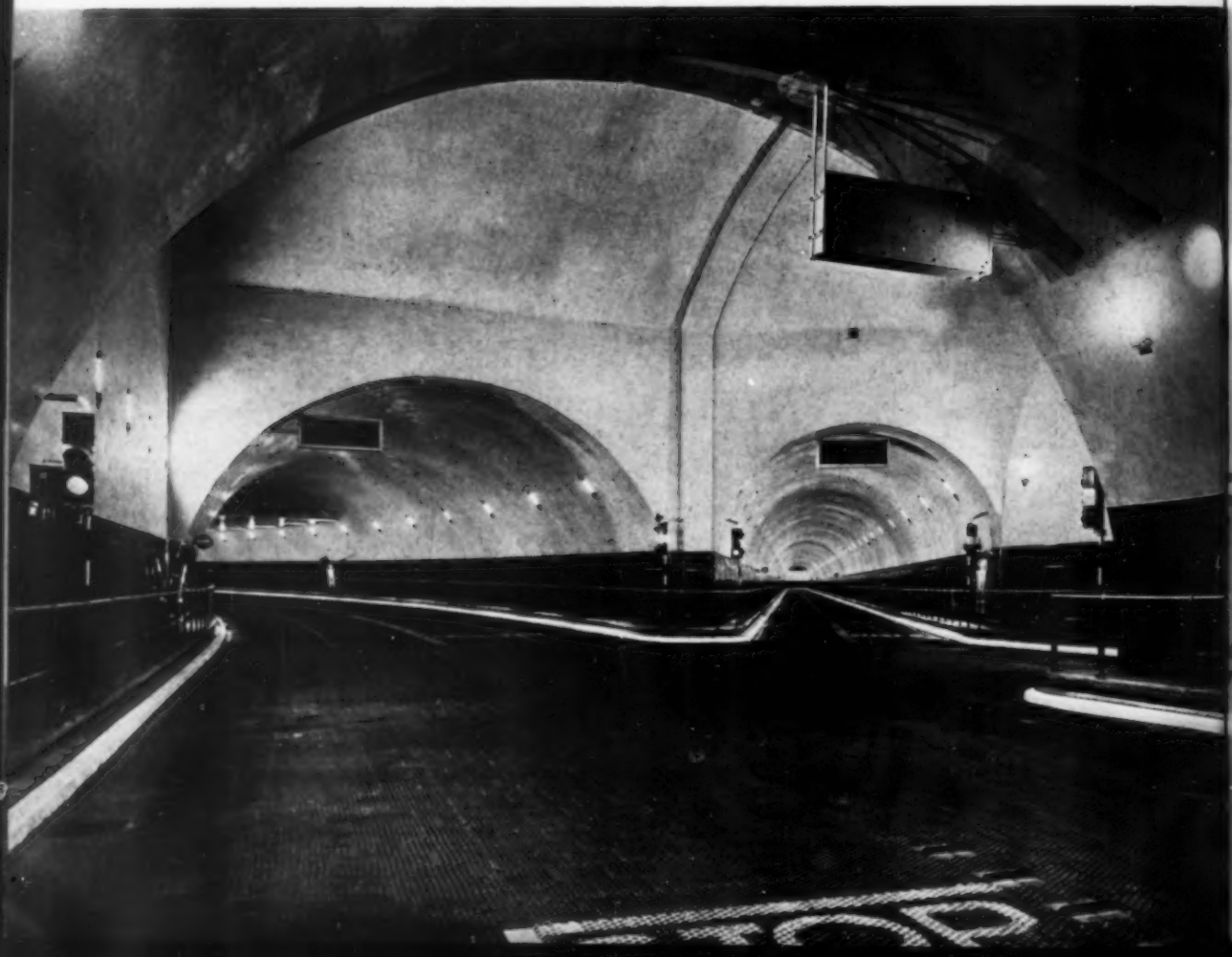
It is believed there is no historical precedent for the simultaneous building of two cathedrals in one city, yet this is happening in Liverpool to-day. Within a mile of the Anglican (Episcopalian) Cathedral described above, there is now a Roman Catholic Cathedral in the early stages of construction.

The late Sir Edwin Lutyens, P.R.A., prepared the original designs for this building, which is to consist of a sequence of barrel vaults converging to carry a great dome 168 feet in diameter. This will cover, with its inner dome, a space some 300 feet high. A feature of the completed cathedral will be the narthex, a great entrance space which will be open day and night, and kept warm, as a spiritual sanctuary for the cold and destitute.

A modern constructional project of quite a different character is to be seen in the Mersey Traffic Tunnel, which connects Liverpool with the neighbouring districts of Cheshire and North Wales. Constructed at a cost of approximately 30 million dollars, this tunnel is one of the largest of its kind in Europe, having a total of 2.87 miles of roadway. There are two entrances on both sides of the river, one on each side being a branch tunnel for dock-side traffic. The main tunnel, 2.13 miles in length, has two fast and two slow traffic lanes, and the capacity of the tunnel is over 4,000 vehicles per hour.

Nowadays one cannot walk far through the streets of the City without seeing the scars left by the air raids of 1940 and 1941, when thousands of citizens were rendered homeless and when the people of Liverpool bore their ordeal with courage and fortitude. On three occasions since they have invested 70 million dollars in War Bonds in a single week, and they now look forward to a time when the scars of war may even be of assistance in planning a city which may be worthy of its long and distinguished history.

Interior of Mersey Tunnel Photo by Stewart Bale Ltd.



NGVIEW FARM ESTATE

ht:—Lyme Cross d; note the var- types of houses cted by the City ncil.
by Stewart Bale Ltd.

e:—Lyme Grove
e
by Palatine Studios

—Hazel Road
ne Cross Road
by Palatine Studios

Varieties of sawfly-resistant wheat, with a susceptible type at left centre

Breeding Wheats for Sawfly Resistance

by A. W. PLATT*

THE GROSS VALUE of the western Canadian wheat crop can be calculated in terms of dollars and cents. It is an impressive amount. Indeed the whole economy of the nation tends to fluctuate as does the value of the wheat crop. But who could place a monetary value on food in time of famine? Who can assess the value of Canadian wheat to democracy in World Wars One and Two, or in the years that lie immediately ahead? It would be interesting to speculate on how different world history might have been without Canadian wheat, but that is not the purpose of this article. In any case, the value and importance of the wheat is generally known. What is not so generally known is that the growing of wheat in Western Canada is based on the production of new varieties suitable for this environment, and that without these varieties wheat production would never have been of any importance. One of the first projects of the Cereal Division of the Dominion Experimental Farm system was the production of early maturing varieties for the short frost-free season of the west. From this project the famous *Marquis* was developed. In later years the problem of disease resistance, particularly stem-rust resistance, received consideration, and the varieties *Renown*, *Regent*, and *Redman* were developed—and now we have *Rescue*, which is resistant not only to stem rust but also to sawfly.

During recent years consideration has been given by the Department to insect resistance with particular reference to sawfly attack. It is the purpose of this article to review the work in this latter field.

According to our entomologists, the wheat-stem sawfly is a small wasp-like insect. It deposits its eggs inside the wheat stem, usually in late June and early July at about the time the wheat crop is starting to head. The egg hatches quickly and the young larva begins feeding on the plant tissues.

*Cerealist, Dominion Experimental Station, Swift Current, Saskatchewan

As the crop nears maturity the larva migrates to the base of the stem and girdles it at ground level. The stem then breaks off and falls to the ground. This constitutes the chief source of damage, as such grain cannot be completely salvaged with present harvesting equipment. The larva overwinters in the stub, pupates in the late spring, and emerges as an adult, thus completing the life cycle.

The sawfly is a native of Western Canada, living originally in certain of the native grasses. With the advent of wheat production the insect transferred its attention to this crop, which it found to be an ideal host. Eventually, almost the entire open-plains area became severely infested. The damage caused has been enormous. Dr. C. W. Farstad of the Dominion Entomological Laboratory, Lethbridge, estimates that the average annual loss of wheat for the past ten years can be valued at twenty million dollars. In addition to this loss, soil conservation has been made more difficult. When the crop is cut at ground level by the sawfly the soil is more susceptible to erosion than when the stubble is left standing. Also, strip cropping, which is a useful conservation practice, is inadvisable when sawflies are plentiful, as they are more difficult to control and cause greater damage under this system of farming.

As one means of combating the ravages of this insect, an attempt was made to develop wheats that would be resistant to sawfly attack. These investigations have been conducted under the direction of Dr. L. H. Newman, Dominion Cerealist, and were centred at the Dominion Experimental Station at Swift Current, which is located in the heart of the severely infested area. Mr. J. G. Taggart was superintendent of this station when the project was begun; a few years later Mr. L. B. Thomson assumed these duties. By their interest, support, and encouragement, both these gentlemen contributed much to the success of this undertaking. The Dominion Entomological Laboratory, Lethbridge, under the direction of Mr. H. L. Seamans and, later, Mr. G. F. Manson, has co-operated in the project, carrying out the entomological phases of the investigation. This work has been under the immediate direction of Dr. C. W. Farstad, entomologist, in charge of sawfly investigations for the Division of Entomology. Many other individuals and institutions have contributed to various aspects of the investigation. Indeed, the whole project is an excellent example of team research with many individuals contributing their special knowledge to the solving of an important problem.

Before a suitable resistant variety could be produced it was necessary to find some wheat that had resistance. Plant breeders cannot produce new characters; they can only re-combine existing ones. This search for a resistant type was under the direction of Mr. H. J. Kemp, formerly of the Swift Current Station, and now located at the Saanichton Station. He imported varieties from all parts of the world and tested them for sawfly resistance. Almost all were susceptible, but some solid-stemmed sorts from New Zealand proved to be resistant. Eggs were deposited in these wheats in the same manner as in ordinary hollow-stemmed ones, but as soon as the grub hatched it was in trouble. It had difficulty in finding suitable food, as the pith cells contained little nourishment; if it managed to survive it had

An adult wheat-stem sawfly — enlarged five times

Courtesy Dominion Entomological Laboratory, Lethbridge

Seed of the Rescue *variety of wheat*

great difficulty in migrating to the base of the stem and almost always died before doing so.

While resistant to sawflies, these wheats were, however, susceptible to stem rust, leaf rust, and smut. They were poor in milling and baking quality, weak strawed, and readily shattered. The task, therefore, was to combine the sawfly resistance of these with the disease resistance and other desirable characteristics of the best Canadian varieties. Accordingly, these New Zealand wheats were crossed with *Renown*, *Apex*, *Thatcher*, and other unnamed hybrid lines. Crossing merely consists in taking the pollen (male elements) from one variety and placing it on the stigma (female organ) of the other.

About 300 seeds were produced in this manner. These were grown individually. All the plants produced were alike and contained certain characteristics of one parent and certain of the other. The seeds from these plants were sown individually—about 30,000 in all. Their progeny was a veritable maze of different types: some resembled one parent; some were more like the other, while all possible combinations of intermediate types were produced.

At this stage, those plants having resistance to sawflies and disease and appearing to be otherwise desirable were selected. Seed from each selected plant was then grown in a short row the following year. The plants within this row continued to "break up" in most cases. That is, some of the plants were resistant to rust, others susceptible; some were bearded, others beardless, and so forth.

Again desirable plants were selected and grown in a short row. This was repeated for two or three years, at which time a portion of the rows ceased to break up. Then, instead of individual plants, whole rows of true-breeding plants were selected. These were the new strains. In the programme being described, about three hundred strains were obtained.

The new strains were then tested to make sure they had the re-combination of characters desired, and to find out which ones would be best for the districts where they were likely to be needed. Their resistance to sawfly was tested in a series of nurseries located at various points in the sawfly area. At each of these points conditions were made as favourable as possible for the sawflies so that the new strains would get a severe test. Those that failed to stand up were discarded.

Similarly, they were tested for rust resistance at the Dominion Cereal Breeding Laboratory, Winnipeg, under the direction of Dr. C. H. Goulden and Dr. R. F. Peterson. Conditions there are much more severe than any that are likely to be encountered in the field. Those that took rust, or showed other undesirable characteristics (such as tendency to shatter), in any of these tests were discarded. Seed harvested from those that remained was tested for milling and baking quality in the laboratories of the Cereal Division, Central Experimental Farm, Ottawa, under the direction of Mr. A. G. O. Whiteside.

Those that passed these tests were placed in yield trials, first at Swift Current and later at numerous points in the sawfly area. These latter tests were conducted on the District Experimental Sub-stations, and were under the direction of Mr. H. Chester of Lethbridge, A. G. Kusch of Scott, and Messrs. P. J. Janzen and E. C. Sackville of Swift Current.

Only three lines survived these tests. These three were then tested for yield, strength of straw, maturity, etc., at all experimental stations and provincial universities in the Prairie Provinces. The grain

from these tests was subjected to extensive milling and baking tests by the chemists of provincial universities, the Board of Grain Commissioners, and the Cereal Division of the Dominion Department of Agriculture. The reaction of these lines to all common diseases was determined by the pathologists of the Dominion Laboratory of Plant Pathology, Winnipeg.

On the basis of all these tests it was decided to discard one of the lines, to test the second further, and to release the third for commercial production under the name of *Rescue*.

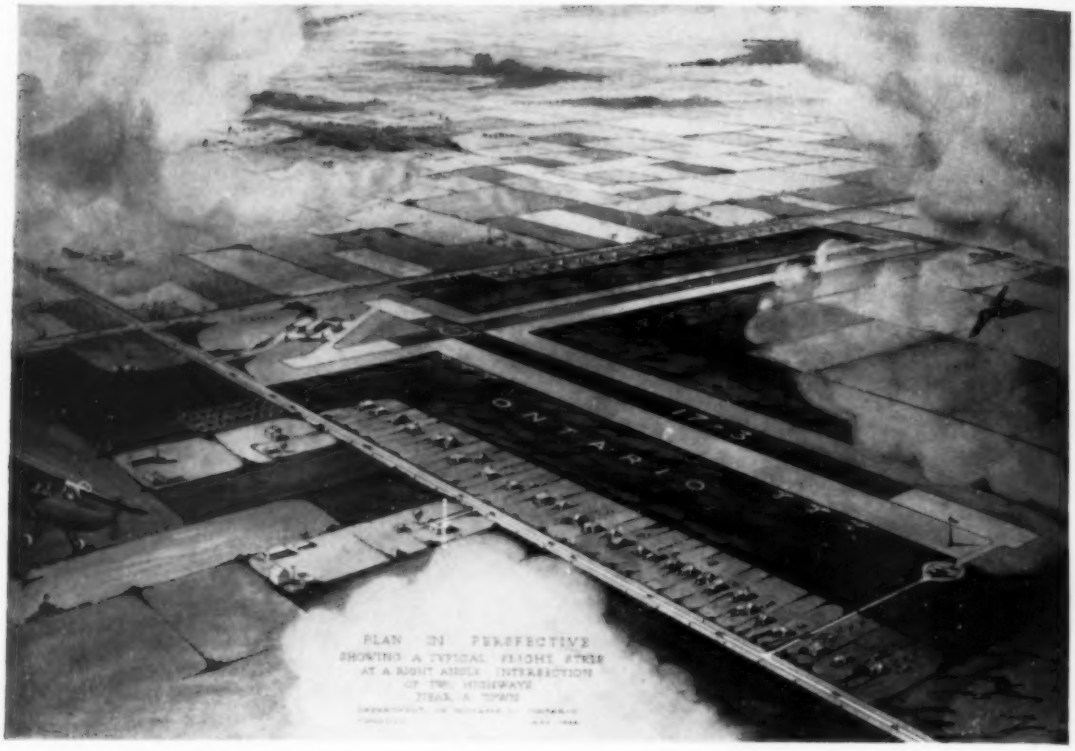
The chief characteristic of *Rescue* is its resistance to sawfly attack. On the average of many tests, only 6.9 per cent of the stems of *Rescue* were damaged by sawfly, whereas 72 per cent of the stems of *Apex* (a commonly grown variety) were damaged. *Rescue* yields well in the open-plains area; the grain is attractive in appearance and high in bushel weight. It is resistant to stem rust but moderately susceptible to root rot and susceptible to leaf rust and bunt (covered smut). In Manitoba and in the parklands of Saskatchewan and Alberta, *Rescue* is not well adapted, being low yielding and weak strawed; but in these areas little sawfly damage occurs. Its chief defect is its baking quality, which is not equal to that of the best Canadian varieties. For this reason it will not grade higher than No. 3 Northern.

While the testing programme was underway, the supply of *Rescue* was increased. It takes a long time to multiply a few pounds to the hundreds of bushels required for commercial production. To facilitate this work, *Rescue* was grown in southern California during the winter months. In this way it was possible to grow two crops a year and so greatly reduce the time necessary for increase. In the spring of 1946 approximately 7,000 acres were seeded to *Rescue*, and, if this crop yields reasonably well, substantial quantities of seed will be available for seeding in 1947.

Rescue wheat may be expected to eliminate, very largely, the enormous losses from sawfly that have occurred during the past twenty years or more. As has been pointed out, it has important defects; but undoubtedly new and better sawfly resistant wheats will be produced in the not-too-distant future. The final defeat of the sawfly appears certain.

Furthermore, this new field of research in Canadian agriculture—resistance to insect attack—points to a method that may be very useful in solving problems concerning other insects and other crops. All this will mean greater returns to the producer and a surer, larger, and cheaper food supply for the masses of mankind.

Heads of Rescue *wheat*



Typical flight strip at a right-angle intersection of two highways near a town

The Future of Airway and Highway Transport in Canada

by J. D. MILLAR*

THE HISTORY of this vast Dominion, with a relatively thin band of population stretching across its southern boundary, clearly demonstrates that transportation has played a major role in uniting the Canadian people and promoting their prosperity. Canoe and schooner, stage-coach and train, motor-car and aeroplane, have opened a continent whose treasures were locked behind the twin barriers of time and space. An efficient transportation system has been, and will continue to be, the foundation on which rests the structure of Canada's social and economic life.

The growth of Canada's transport system has been far from tranquil. No captain of a sailing schooner was ever convinced that the stage-coach and the steamboat were other than inventions of "Old Nick" himself; no locomotive engineer would ever admit that the motor vehicle and the aeroplane were more than annoying young upstarts in the transport field. There have been quarrels, costly competition, and overlapping of services; there has been unjustifiable optimism in some areas and stubborn pessimism in others. But in spite of these, or possibly because of them, astonishing progress has been made. Transportation has outgrown its adolescence; it has come of age, and wisdom has come with maturity. To-day it is recognized that each form of transportation

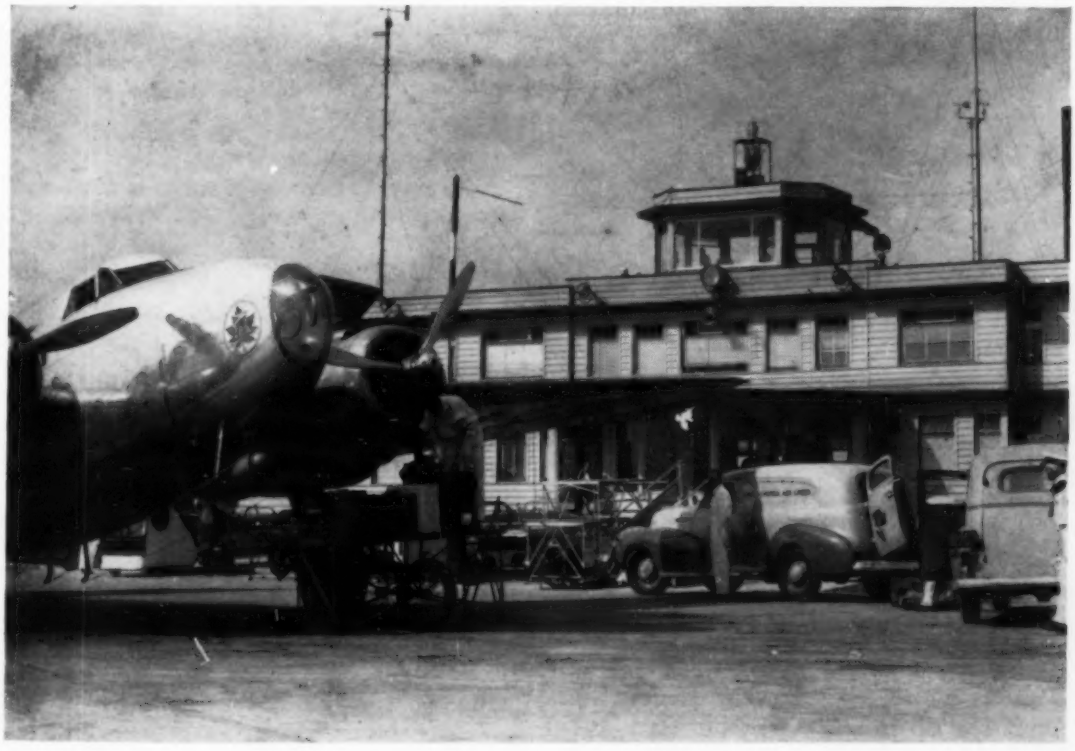
*Deputy Minister, Ontario Department of Highways

has its own useful part to play—that there is room for all. Be it bulk freight, express or passengers, the business will fall to the transport agency best suited to handle it. In the great test of the recent conflict, petty jealousies were subordinated to the one task of winning the war. It is to be hoped that the same harmony will prevail in the years to come.

As the most spectacular and speedy means of moving from point to point on the earth's surface, the aeroplane commands more public attention and is, moreover, the subject of more conjecture at the moment than any of its predecessors in the transport field. Thoughtful Canadian citizens, conscious of the important role which aircraft have played in the development of the remote areas of the nation, and justifiably proud of the accomplishments of their airmen in the battlefields of the sky, are asking the question: "Will air transport hold in peacetime the important place it has commanded in war?" The extent to which this question may be answered in the affirmative will vitally affect the transport system which has made Canada strong and prosperous.

It would appear, in the light of previous experience, that the answer must be in the affirmative. There was convincing evidence, even before the war, that air transport had come to stay and would expand as the years passed. The radical changes in the routine of everyday life brought about by the introduction of the motor vehicle were fresh in people's minds and it was no longer safe to make emphatic predictions that a new form of transportation was impractical and only a passing fancy. Fortunately, too, air transport was accepted by those administering the established water and rail carriers, not as a competitor, as had been the case with automotive transport, but as a partner and an equal. They had learned the lesson of two decades, from 1915 to 1935: that it is better to co-operate with and absorb a new mode of transport rather than attempt to stifle its growth by legislative enactments.

Loading a T.C.A. ten-passenger Lockheed plane at Malton Airport, Toronto, Ontario.
Photo courtesy Trans-Canada Air Lines



Airway and highway transport have gone hand in hand since the early days of the aeroplane. A glance at a modern airport will show how closely the two are interlocked. When a plane lands, its passengers are immediately switched to waiting cabs or buses, which carry them on their way to their final destination. Around the grounded plane swarms a small fleet of express trucks, gasoline tank wagons and supply vehicles of various kinds, each an integral part of the airport operation. The motor vehicle and the aeroplane, both the product of the internal combustion engine, have symbolized twentieth-century progress.

Gifted indeed would have been the writer who, at the turn of the century, could have foretold accurately the great changes in our mode of living which the motor-car was to bring. Equally gifted is he who, in this turbulent year of 1946, can forecast the future of aviation.

Great strides were made during the war in improving aircraft design and navigation aids. New metal alloys, radar, jet propulsion, gasoline turbine engines, and atomic power, in a thousand ways yet undeveloped, will make vast changes in the aeroplane of the future. True, the private aeroplane is still a rich man's toy; but so was the motor-car in 1915. Price lists for early automobiles are remarkably similar to those for light aircraft to-day. Just as there were few roads in 1915, so there are insufficient modern airports in 1946 to handle the increased air traffic of the future. Consider too the question of qualified pilots; their numbers, like those of persons who were equipped to drive the early motor-cars are relatively limited.

It is not unreasonable, therefore, to assume that the plane of the future will be as safe in the hands of the average pilot as is the motor-car on a crowded highway in the hands of the average driver to-day. A new generation, born in a world of three-dimension travel and accustomed to machinery before learning to talk, is fast growing up. If a grandmother of seventy can drive a motor-car through city traffic (and plenty of them do), her grandson should have no great difficulty in mastering a light aeroplane.

Even assuming that the private aeroplane will never become commonplace, there is still a pressing need for airport facilities for commercial aircraft handling passenger traffic, mail, express and perishable freight. What form will these airports take and how will they be provided? There seems to be a fruitless controversy raging between the exponents of the large airport and the small. Both have points in their favour. The small airport is to Montreal's Dorval or Toronto's Malton what a back concession road is to Ontario's Queen Elizabeth Way. Each is necessary for the type and volume of traffic it handles, and each will retain its relative importance regardless of what advances are made in aviation. It is the lack of smaller airports serving the smaller communities which provides the problem of the moment. The large centres of population have emerged from the war with airports capable of handling the greater percentage of commercial aircraft—but what of the many cities and towns ranging in population from 1,000 to 20,000 inhabitants? Are they to be denied the advantages of air transportation because they cannot support an airfield with multiple runways 5,000 to 8,000 feet in length? This is not the case with rail or highway transport, the network of which is based on a limited number of trunk lines with less elaborate feeders serving the smaller communities. Records show that at the close of the war only 100, of some 580 cities, towns and villages throughout Canada in excess of 1,000 population, have suitable landing fields.

The aviation industry is facing the same problem as did the automotive industry in 1915. Then there were cars, but no roads on which to drive them. With a limited number of motor vehicles registered, the license fees were inadequate to pay more than a small fraction of the cost of building and maintaining suitable highways from town to town. Highways were built as an investment by the various municipalities, the provinces and the Federal Government, in anticipation of future revenue from the motor

vehicle. In the Province of Ontario, for example, this investment has been highly successful. Excluding the cost of highway development for purely local needs (which was borne by the local municipalities), the Province has spent approximately 500 million dollars on trunk highways and in the form of subsidies to local municipalities to cover inter-city and inter-provincial traffic needs. The motor vehicle is to-day returning in license fees and gasoline tax an average of more than 35 million dollars per year, or 7 per cent on the investment. Quite apart from the indirect return in improved living conditions, benefit to trade and commerce and the very considerable cash return from the tourist traffic, this yearly income is one of the mainstays of provincial revenue. The motorist has at all times been willing to contribute to the cost of providing improved highway facilities, and there is every reason to believe that the light-aircraft owner would likewise be prepared to pay for value received in the form of a greatly increased number of landing fields.

Whether an airport for a community be large or small, its future is definitely linked with highway connections to the town it serves; and thus the need arises for co-ordination of plans for both. In the past, too many airports have been established without due consideration being given to the access roads by which they were served. If an airport can be located on a trunk highway, or if new trunk highways can be located in the vicinity of suitable airport sites, both forms of transport will benefit. Highways and airports are constructed by the same methods and maintained by the same mechanical devices. Grading, drainage, winter maintenance, signing, illumination, traffic control, and even weather reports, have counterparts in both highway and airway systems. The most practical suggestion for small landing fields is the "L"-shaped airstrip at the intersection of two public roads adjacent to a town. It can be adapted to local conditions and served by a combined highway-airway filling station. Minor mechanical repair service, together with taxi and restaurant facilities, could also be provided by such a filling station, which will not at the start have to depend solely on the aircraft trade. Hangars, paved runways and additional landing strips can be added as air traffic increases.

Any community which plans to establish a small airport would be well advised to bear in mind the difficulties which have arisen in connection with highway construction. It is as important, for instance, to control the area adjacent to a highway as it is to control the highway itself. City building by-laws have recognized this principle for many years, but only quite recently has it been applied in rural areas. If a landing field is planned with the intention of expanding at a later date, the adjoining land must be placed under lease or municipal by-law control to prevent the erection of buildings which would interfere with aircraft operation or any future runway extension.

Canada stands on the threshold of enormous development, and air transport will play an increasingly important part in the lives and welfare of its citizens. No other country offers such an opportunity—and such a challenge—to its youth.

Entrance to Malton Airport
Photo courtesy Trans-Canada Air Lines

"The Descent of the Fraser River, 1908", From a painting by C. W. Jefferys

Courtesy Canadian Bank of Commerce

Fraser Rides the Fraser

by LAWRENCE J. BURPEE

SIMON FRASER, like so many of the pathfinders of Canada, was both fur-trader and explorer. He was born in 1776 at Bennington in New York. As a boy he was brought to Cornwall, on the upper St. Lawrence, and the neighbourhood must have taken a strong hold upon his affections, for more than thirty years later, when he retired from the fur trade, he settled at St. Andrews, near Cornwall, and spent the rest of his life there.

Fraser was apprenticed to the North West Company in 1792, and in 1801 became a partner. For some years he was employed in the Athabaska Department, and in 1805 was put in charge of the Company's operations in New Caledonia, west of the Rocky Mountains. Three years later he made the daring and important journey that gave him an assured place in the story of Canadian discovery.

Fifteen years before, another adventurous Scot, Alexander Mackenzie, had gone down the big river on which Fort George stood to a place later known as Alexandria, but had then turned back. In 1808 the greater part of the river was unknown to white men, and it was supposed to be the Columbia; Fraser made up his mind to follow it down to the sea. On a May day in 1808, he set out, with John Stuart, Jules Maurice Quesnel, nineteen voyageurs, and two Indian guides, to explore the wild, tumultuous river that was later to be known as the Fraser.

As he travelled downstream, Fraser came in contact with strange Indians, members of tribes known as Atnahs and Tahowtins, who arrived on horseback. They were friendly, but warned him that the river was very difficult—a succession of waterfalls and rapids rushing down between steep, impassable cliffs. However, as there seemed to be no way of travelling overland, Fraser decided to make the attempt.

"I ordered the five best men out of the crews into a canoe lightly loaded", he says, "and the canoe was in a moment under way. After passing the first cascade, she lost her course and was drawn into the eddy where she was whirled about for a considerable

time, seemingly in suspense whether to sink or swim, the men having no power over her. However, she took a favourable turn and by degrees was led from this dangerous vortex again into the stream. In this manner she continued, flying from one danger to another until the last cascade but one, where, in spite of every effort, the whirlpools forced her against a low projecting rock. Upon this the men debarked, saved their own lives and contrived to save the property, but the greatest difficulty was still ahead, and to continue by water would be the way to certain destruction.

"During this distressing scene, we were on shore looking on and anxiously concerned. Seeing our poor fellows once more safe afforded us as much satisfaction as to themselves, and we hastened to their assistance, but their situation rendered our approach perilous and difficult. The bank was extremely high and steep, and we had to plunge our daggers at intervals into the ground to check our speed, as otherwise we were exposed to slide into the river. We cut steps in the declivity, fastened a line to the front of the canoe, with which some of the men ascended in order to haul it up, while the others supported it upon their arms. In this manner our situation was most precarious, our lives hung, as it were, upon a thread, as the failure of the line or a false step of one of the men might have hurled the whole of us into Eternity. However, we fortunately cleared the bank before dark."

The Indians again urged Fraser to give up the idea of travelling down the river. By going on horseback, they told him, his party would, in four or five days, reach another large river (the Thompson), whose navigation was much easier than that of the Fraser, and which emptied into it farther down. However, he was determined at all costs to explore the Fraser. That was what he had set out to do, and that was what he would do. He still thought he was on the Columbia, and it was not until he actually reached the mouth of the river that he found, somewhat to his disgust, that this was an entirely different stream, much farther north than the mouth of the Columbia, which had been discovered some time before.

So the party struggled down the Fraser, sometimes on its turbulent surface, sometimes scrambling along its rocky banks. Early in June they came to a rapid that far surpassed all they had previously encountered. "Here", says Fraser, "the channel contracts to about forty yards, and is enclosed by two precipices of immense height which, bending towards each other, make it narrower above than below. The water which rolls down this extraordinary passage in tumultuous waves and with great velocity had a frightful appearance. However, it being absolutely impossible to carry the canoes by land, all hands without hesitation embarked as it were *à corps perdu* upon the mercy of this awful tide. Once engaged the die was cast. One great difficulty consisted in keeping the canoes within the medium or *fil d'eau*; that is, clear of the precipice on one side and from the gulfs formed by the waves on the other. Thus skimming along as fast as lightning, the crews, cool and determined, followed each other in awful silence, and when we arrived at the end, we stood gazing at each other in silent congratulation at our narrow escape from total destruction."

So went the story, from day to day, of a journey of almost constant danger and anxiety. Fraser was descending the river at the most difficult season of the year, when even the Indians, magnificient canoemen, did not venture upon it. However, he got through, without losing any of his men, and finally came to where the stream divided into several channels. He landed at an Indian village named Misquaime, not far from the present city of New Westminster, almost within sight of the sea, where he had much the same experience as Alexander Mackenzie. As his party went downstream, the Indians became more hostile, and in the end Fraser, like Mackenzie, had to turn back before he had quite completed his journey to the sea.

The return trip, fortunately, was comparatively uneventful, and early in August Fraser and his men were again at Fort George.

J. E. H. MacDonald—Painter of the Forest

by DONALD W. BUCHANAN

THE BRILLIANCE of Canadian autumn, spreading over our northern hillsides, is repeated in rich patterns in the Algoma landscapes of J. E. H. MacDonald. Out of these handsome scenes of October in the North, he created compositions that were great woven tapestries of clear sky and bright foliage.

His best works—wilderness scenes and lonely northern horizons—were painted mainly after 1918. In them, gaiety of colour enlivens the austere backgrounds of rocky escarpments and deep-flowing rivers.

His earlier sketches, done many years before, of the ravines and farmlands near his suburban home in Toronto, or farther north in the forest, had been more uncompromising in their simple realism. Yet such homespun virtues as he then possessed were remarkable enough. When these sketches were first exhibited in 1911, one critic wrote: "MacDonald's art is native—as native as the rocks, or the snow, or pine trees, or the lumber drives that are so largely his themes. He seems to be able to forget what other men have selected, and how other men have expressed themselves, and in an age of such universal information as ours, and in a country so provincial and imitative in its tastes as Canada, these are rare qualities."

Although born in England, he had come to Canada at an early age and received his art education in Hamilton, Ontario. Later, in an engraving firm in Toronto, he had as his fellow employees many of the artists, such as Lismer and Varley, who were afterwards to join him in forming the "Group of Seven". There, too, he made friends with Tom Thomson. While tied during the week to his job, he always devoted his Sundays and holidays to painting in the countryside. Of great stimulus were the friendships he made about 1912 with the artists, A. Y. Jackson and Lawren Harris, whom he later accompanied on various extended trips to Georgian Bay and farther north.

From 1918 onwards, during his frequent visits to Algoma, he sent back letters that were deeply expressive of the wonder he felt before those rugged panoramas of craggy hills and mixed coniferous and hardwood forests. His trips in the region of Lake Superior took him to the valley of the little-known Montreal River, where he did the sketches for his large canvas, "The Solemn Land".

By 1921 and 1922, MacDonald, who some years before had given up his position with the engraving firm to concentrate upon landscape art entirely, had begun to produce his best works, the most satisfying in composition and the most brilliant in colouring. The canvas, "Gleams on the Hills", now in the collection of the National Gallery of Canada, dates from this period.

His struggles to earn a living from easel painting, however, did not prove successful. Like most Canadian painters he found that critical acclaim was not always followed by a rush to purchase; and so he gratefully accepted the teaching position offered him in 1921 at the Ontario College of Art, subsequently becoming Principal of the College.

On his holidays in those last years of his life, he went mainly to the Rocky Mountains. Their distant solitudes seemed to satisfy that continual hunger which he possessed for meditation amidst the unspoiled scenes of nature. In this he was a disciple of Thoreau, the New England writer, whose books and essays he cherished. He would go climbing high into the snow-lined passes and sit there all afternoon sketching, with no sound to be heard to break the stillness except the rare whistle of some furry marmot among the rocks. He now changed his style, but his experiments in simplification of pattern did not equal that finer weaving of colour and contour to be found in his Algoma compositions. Many of these larger alpine canvases, as well as some paintings he did in Nova Scotia of beach and ocean, are as flat as any poster. On the other hand, some of the smaller sketches which he did in the Rockies retain his former freedom.

Exhausted by his teaching tasks, and by the physical collapse which resulted, he died in November, 1932.

In retrospect one can say of his career that, with the exception of that mountain interlude, "his ideal was to portray the forest". It was an ambition he fully achieved. Yet we remember him also for his sketches of Ontario farmlands, for a few utterly bright and joyous paintings of autumn leaves falling upon rocky streams, and also for one or two surprising studies of city scenes, such as "Tracks and Traffic", now in the collection of the Art Gallery of Toronto, where the subject is the smoke and the grime and the dirty grey snow of a busy freight-yard in winter.

Left:—"The Solemn Land" by J. E. H. MacDonald, R.C.A.
From the collection of the National Gallery of Canada

EDITOR'S NOTE-BOOK

Edward Taube, Ph.D., F.A.G.S., spent his early days in Saskatchewan. After graduating from the University of Alberta, he continued his studies at Wisconsin and later at various European universities. He is now on the staff of the University of Western Ontario. Dr. Taube has had several articles printed in various publications, including *Economic History*, *The Scientific Monthly*, and *The Geographical Review*. As a Fellow of the American Geographical Society, he is interested "in exploration and travel, in the spread of geographical knowledge, and in the advancement of science". Introduced to the problems of city planning and development in a course on "Metropolitan Chicago" at the University of Chicago, he subsequently felt that the knowledge so gained could be applied to London, Ontario, where town planning is now a live subject.

* * *

W. C. Hopper, B.S.A., M.S., Ph.D., graduated from the University of Toronto in 1920, following which he became Field Husbandman with the Dominion Experimental Farm, and later Chief Assistant in the Division of Field Husbandry. Subsequently, he went to Cornell University to take post-graduate work, in the course of which he accepted an Instructorship in Agricultural Economics to do marketing research and teaching. In 1932 he was granted a Ph.D. degree in Economics and became an Extension Professor in Marketing. Dr. Hopper left Cornell in 1934 to become Senior Economist with the United States Department of Agriculture at Washington, but later in the year returned to Canada to become Chief of the Division of Marketing and Secretary of the Dominion Marketing Board. In 1937 he was appointed Principal Economist in the Economics Division of the Dominion Department of Agriculture. His work in the United States and travel in connection with his various positions have given Dr. Hopper a wide knowledge of agricultural and business conditions as well as markets both in the States and Canada. Before and during the war he served on a number of committees, including the Agricultural Supplies Board, the Consumer Information Committee, the Food Information Committee, etc., and also addressed numerous meetings, in addition to writing a great many reports, bulletins and other publications dealing with agricultural economics.

* * *

Lawrence J. Burpee—See biographical sketch in January, 1946, issue.

* * *

Donald W. Buchanan—See biographical sketch in June, 1946, issue.

AMONGST THE NEW BOOKS

Painters of Quebec
by MARIUS BARBEAU
(Toronto, Ryerson Press, 1945, bound $1.00, paper 60c)

Each of the splendid little volumes of the Canadian Art Series has been devoted to the life and work of a single artist, with the exception of Thoreau MacDonald's *Group of Seven*. Now we have Marius Barbeau writing with equal authority and charm on the *Painters of Quebec*, another group whose achievements and promise for the future of Canadian art he rightly considers merits an appraisal. No one could be better equipped than Dr. Barbeau for the congenial task he set himself. He says: "The knowledge whereof I write here is from: (1) personal experience; (2) consultations with the artists who are still living or with people who have known them; (3) the study of their work, or (4) primary sources wherever available." The result is an intensely interesting series of essays, biographical and critical, on eight painters of French Canada who owe much of their inspiration to the scenes and traditions of Quebec, though two of them were born in Europe. One of these is André Biéler, now professor of art at Queen's University. The other, Henri Masson, lives in Ottawa, but Dr. Barbeau considers him among the leading painters of French-speaking Canada. The

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remaining six artists whose careers are dealt with are Marc-Aurèle de Foy Suzor-Côté, Clarence Gagnon, Marc-Aurèle Fortin, Adrien Hébert, Jean-Paul Lemieux and Alfred Pellan. Of the two last named, the author has this to say: "The impact of the fresh standards of Lemieux and particularly of Pellan in the education of Quebec and Montreal has been wholesome, nay, startling".

Examples of the work of the eight artists and a portrait by Tonnancour form the twenty-eight illustrations in this delightful little book, which also contains a selected bibliography for readers who wish to increase their knowledge of this important field of Canadian culture.

F. E. FORSEY

* * *

The Northland, Ontario
by O. T. G. WILLIAMSON
(Toronto, Ryerson Press, 1946, $1.50)

The author of this valuable book has known Northern Ontario for almost forty years through construction work, mining, surveying and prospecting. Through his own experiences with paddle and tumpline, pick and shovel, level and transit, he can give the proper value to the achievements of those who do the world's work the hard way and pay eloquent tribute to their accomplishments in this North Country. In a series of closely wrought chapters, Mr. Williamson tells a truly romantic story extending from the early travels of adventurers and fur-traders to the present day of prosperous mining towns, great lumbering enterprises, water-power development, efficient and expanding transportation facilities, and the opening up of rich agricultural areas in the great Clay Belt.

It seems incredible that most of this progress has taken place in the last forty years. In fact, as late as 1900, we are told, all of Northern Ontario north of the Canadian Pacific Railway was virtually unknown. In that year, stirred by prospectors' tales and a general feeling of "something lost beyond the ranges", the Ontario Government authorized a comprehensive plan of exploration across the whole northern width of the province. Ten parties were sent out under competent land surveyors, with experienced land and timber experts and geologists attached. Their reports showed that great areas of agricultural land existed, and allayed the apprehension felt as to the depletion of the timber resources. Power sites were numerous and stream conditions good for their development, while the character and location of rock formations gave promise of important mineral discoveries. (*Continued on page XI*)

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(*Continued from page X*)

Other surveys, federal and provincial, followed: that of E. A. Sullivan and A. W. G. Wilson in 1904, of Sidney C. Ells in 1911, the Naval Service exploration of the James Bay region in 1914, as well as a series of railway surveys, all of them pointing the way to new enterprises, and used with boldness and courage by the now awakened government, but more persistently by the many visionaries whose faith led them, through hardship and often heartbreaking struggle, to riches and fame. Mr. Williamson's narrative is studded with their names and many racy and exciting stories he tells with obvious enjoyment.

The chapter entitled "Far Fields" deals with the amazing extent of the lands suitable for agriculture and forestry, and the ways by which it may be further developed for settlement of large numbers of people. He tells of rich crops and prosperous farms. "In the districts of Timiskaming and Cochrane", for instance, "there are 175,000 acres of improved land. In the Great Clay Belt are 16,000,000 acres. It is an area equal to all the cultivated land of Southern Ontario south of the Mattawa, Lake Nipissing and the French."

That the Ontario Government is fully alive to the value of the timber resources of the region is shown in the chapter on "Timber-r-r", which deals not only with its cultivation but also its preservation from the two great menaces, fire and insects.

Mr. Williamson has also an enchanting chapter on the Northland as a playground, a paradise of surpassingly beautiful scenery for fishermen. He says: "The Northland is a country with a personality. It is compounded of optimism, fortitude and a gay willingness to take a chance. It is reflected in its people and it breeds a hardy race. The North Country opens its arms to men and women of like character . . . Rich or poor, the Northland asks only of its people that they be resolute and steadfast. For these it has a sure reward. They will come into their own, but whether soon or late depends on the moral fibre of Canadians as a whole."

One wishes for an index and for more of Evan Macdonald's imaginative and delectable drawings.

F. E. FORSEY

* * *

Wilderness Adventure
by ELIZABETH PAGE
(Rinehart & Co., New York and Toronto, $2.50 U.S.)

AN HISTORICAL novel that creaks cumbersomely from the Virginia of the early eighteenth century to the Ohio, the Mississippi, New Orelans, and thence to France and England. The reader will have the feeling that the author knows little of life on the American frontier in 1730, of forest travel or of the geography of the country covered by the book. Frankly neither the author nor her characters seem at home in either the new world or the old.

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